CRPL-F 108

IONOSPHERIC DATA

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U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
WASHINGTON, D. C.

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SYMBOLS, TERMINOLOGY, CONVENTIONS

Beginning with data reported for January 1952, the symbols, terminology, and conventions for the determination of median values used in this report (CRPL-F series) conform as far as practicable to those adopted at the Sixth Meeting of the International Radio Consultative Committee (C.C.I.R.) in Geneva, 1951. Excerpts concerning symbols and terminology from Document No. 626-E of this Meeting are given on pages 2-7 of the report CRPL-F89, "Ionospheric Data," issued January 1952. Reprints of these pages are available upon request.

Beginning with data for January 1945, median values are published wherever possible. Where averages are reported, they are, at any hour, the average for all the days during the month for which numerical data exist.

The following conventions are used in determining the medians for hours when no measured values are given because of equipment limitations and ionospheric irregularities. Symbols used are those given in Document No. 626-E referred to above.

a. For all ionospheric characteristics:

Values missing because of A, C, F, L, M, N, Q, S, or T are omitted from the median count.

b. For critical frequencies and virtual heights:

Values of foF2 (and foE near sunrise and sunset) missing because of E are counted as equal to or less than the lower limit of the recorder. Values of h'F2 (and h'E near sunrise and sunset) missing for this reason are counted as equal to or greater than the median. Other characteristics missing because of E are omitted from the median count.

Values missing because of D are counted as equal to or greater than the upper limit of the recorder.

Values missing because of G are counted:

1. For foF2, as equal to or less than foF1.
2. For h'F2, as equal to or greater than the median.

The symbol W is included in the median count only when it replaces a height characteristic. This practice represents a change from that listed in issues previous to CRPL-F78.

Values missing for any other reason are omitted from the median count.

c. For MUF factor (M-factors):

Values missing because of G or W are counted as equal to or less than the median.

Values missing for any other reason are omitted from the median count.

d. For sporadic E (Es):

Values of fEs missing because of E or G (and B when applied to the daytime E region only) are counted as equal to or less than the median foE, or equal to or less than the lower frequency limit of the recorder.

Values of fEs missing for any other reason, and values of h'Es missing for any reason at all are omitted from the median count.

Beginning with data for November 1945, doubtful monthly median values for ionospheric observations at Washington, D. C., are indicated by parentheses, in accordance with the practice already in use for doubtful hourly values. The following are the conventions used to determine whether or not a median value is doubtful:

1. If only four values or less are available, the data are considered insufficient and no median value is computed.

2. For the F2 layer, if only five to nine values are available, the median is considered doubtful. The E and F1 layers are so regular in their characteristics that, as long as there are at least five values, the median is not considered doubtful.

3. For all layers, if more than half of the values used to compute the median are doubtful (either doubtful or interpolated), the median is considered doubtful.

The same conventions are used by the CRPL in computing the medians from tabulations of daily and hourly data for stations other than Washington, beginning with the tables in IRPL-F18.

The tables and graphs of ionospheric data are correct for the values reported to the CRPL, but, because of variations in practice in the interpretation of records and scaling and manner of reporting of values, may at times give an erroneous conception of typical ionospheric characteristics at the station. Some of the errors are due to:

a. Differences in scaling records when spread echoes are present.

b. Omission of values when foF2 is less than or equal to foF1, leading to erroneously high values of monthly averages or median values.

c. Omission of values when critical frequencies are less than the lower frequency limit of the recorder, also leading to erroneously high values of monthly average or median values.

These effects were discussed on pages 6 and 7 of the previous F-series report IRPL-F5.

Ordinarily, a blank space in the fEs column of a table is the result of the fact that a majority of the readings for the month are below the lower limit of the recorder or less than the corresponding values of foE. Blank spaces at the beginning and end of columns of h'F1, foF1, h'E, and foE are usually the result of diurnal variation in these characteristics. Complete absence of medians of h'F1 and foF1 is usually the result of seasonal effects.

The dashed-line prediction curves of the graphs of ionospheric data are obtained from the predicted zero-muf contour charts of the CRPL-D series publications. The following points are worthy of note:

a. Predictions for individual stations used to construct the charts may be more accurate than the values read from the charts since some smoothing of the contours is necessary to allow for the longitude effect within a zone. Thus, inasmuch as the predicted contours are for the center of each zone, part of the discrepancy between the predicted and observed values as given in the F series may be caused by the fact that the station is not centrally located within the zone.

b. The final presentation of the predictions is dependent upon the latest available ionospheric and radio propagation data, as well as upon predicted sunspot number.

c. There is no indication on the graphs of the relative reliability of the data; it is necessary to consult the tables for such information.

The following predicted smoothed 12-month running-average Zurich sunspot numbers were used in constructing the contour charts:

Month	Predicted Sunspot Number								
	1953	1952	1951	1950	1949	1948	1947	1946	1945
December		33	53	86	108	114	126	85	38
November		38	52	87	112	115	124	83	36
October		43	52	90	114	116	119	81	23
September		46	54	91	115	117	121	79	22
August		49	57	96	111	123	122	77	20
July	20	51	60	101	108	125	116	73	
June	21	52	63	103	108	129	112	67	
May	22	52	68	102	108	130	109	67	
April	24	52	74	101	109	133	107	62	
March	27	52	78	103	111	133	105	51	
February	29	51	82	103	113	133	90	46	
January	30	53	85	105	112	130	88	42	

WORLD-WIDE SOURCES OF IONOSPHERIC DATA

The ionospheric data given here in tables 1 to 60 and figures 1 to 120 were assembled by the Central Radio Propagation Laboratory for analysis and correlation, incidental to CRPL prediction of radio propagation conditions. The data are median values unless otherwise indicated. The following are the sources of the data in this issue:

Republica Argentina, Ministerio de Marina:
Buenos Aires, Argentina
Decepcion I.

Australian Department of Supply and Shipping, Bureau of Mineral Resources, Geology and Geophysics:
Watheroo, Western Australia

University of Graz:
Graz, Austria

Meteorological Service of the Belgian Congo and Ruanda-Urundi:
Leopoldville, Belgian Congo

British Department of Scientific and Industrial Research, Radio Research Board:
Falkland Is.
Ibadan, Nigeria (University College of Nigeria)
Inverness, Scotland
Khartoum, Sudan (University College of Khartoum)
Port Lockroy
Singapore, British Malaya
Slough, England

Defence Research Board, Canada:
Baker Lake, Canada
Fort Chimo, Canada
Resolute Bay, Canada
St. John's, Newfoundland

Radio Wave Research Laboratories, National Taiwan University, Taipeh, Formosa, China:
Formosa, China

French Ministry of Naval Armaments (Section for Scientific Research):
Tananarive, Madagascar

Institute for Ionospheric Research, Lindau Uber Northeim, Hannover, Germany:
Lindau/Harz, Germany

The Royal Netherlands Meteorological Institute:
De Bilt, Holland

Ministry of Postal Services, Radio Research Laboratories, Tokyo, Japan:
Akita, Japan
Tokyo (Kokubunji), Japan
Wakkanai, Japan
Yamagawa, Japan

Christchurch Geophysical Observatory, New Zealand Department of Scientific and Industrial Research:
Christchurch, New Zealand
Rarotonga, Cook Is.

Norwegian Defence Research Establishment, Kjeller per Lillestrom, Norway:
Oslo, Norway
Tromso, Norway

Manila Observatory:
Baguio, P. I.

Research Laboratory of Electronics, Chalmers University of Technology, Gothenburg, Sweden:
Kiruna, Sweden

Research Institute of National Defence, Stockholm, Sweden:
Upsala, Sweden

Royal Board of Swedish Telegraphs, Radio Department, Stockholm, Sweden:
Lulea, Sweden

Post, Telephone and Telegraph Administration, Berne, Switzerland:
Schwarzenburg, Switzerland

United States Army Signal Corps:
Adak, Alaska
Okinawa I.
White Sands, New Mexico

National Bureau of Standards (Central Radio Propagation Laboratory):
Anchorage, Alaska
Baton Rouge, Louisiana (Louisiana State University)
Fairbanks, Alaska (Geophysical Institute of the University of Alaska)
Guam I.
Huancayo, Peru (Instituto Geofisico de Huancayo)
Maui, Hawaii
Narsarssuak, Greenland
Panama Canal Zone
Puerto Rico, W. I.
San Francisco, California (Stanford University)
Washington, D. C.

HOURLY IONOSPHERIC DATA AT WASHINGTON, D. C.

The data given in tables 61 through 72 follow the scaling practices given in the report IRPL-C61, "Report of International Radio Propagation Conference," pages 36 to 39, and the median values are determined by the conventions given above under "Symbols, Terminology, Conventions." Beginning with September 1949, the data are taken at Ft. Belvoir, Virginia.

IONOSPHERIC STORMINESS AT WASHINGTON, D.C.

Table 73 presents ionosphere character figures for Washington, D. C., during July 1953, as determined by the criteria given in the report IRPL-R5, "Criteria for Ionospheric Storminess," together with Cheltenham, Maryland, geomagnetic K-figures, which are usually covariant with them.

RADIO PROPAGATION QUALITY FIGURES

Tables 74a and 74b give for June 1953 the radio propagation quality figures for the North Atlantic area, CRPL advance and short-term forecasts, a summary geomagnetic activity index and sundry comparisons, specifically as follows:

(a) radio propagation quality figures, separately for each 6-hour interval of the Greenwich day, viz., 00-06, 06-12, 12-18, 18-24 hours UT (Universal Time or GCT).
(b) whole-day radio quality indices (beginning October 1952). Each index is a weighted average of the four quarter-day Q-figures, before rounding off, with half weight given to quality grades 5 and 6. This procedure tends to give whole-day indices suitable for comparison with whole-day advance forecasts which designate whenever possible the days when significant disturbance or unusually quiet conditions will occur.
(c) short-term forecasts, issued by CRPL every six hour (nominally one hour before 00^h, 06^h, 12^h, 18^h UT) and applicable to the period 1 to 13 (especially 1 to 7) hours ahead. Note that new scoring rules have been adopted beginning with October 1952 data.
(d) advance forecasts, issued semiweekly (CRPL-J reports) and applicable 1 to 3 or 4 days ahead, 4 or 5 to 7 days ahead, and 8 to 25 days ahead. These forecasts are scored against the whole-day quality indices.
(e) half-day averages of the geomagnetic K indices measured by the Cheltenham Magnetic Observatory of the U. S. Coast and Geodetic Survey.
(f) illustration of the comparison of short-term forecasts and Q-figures.
(g) illustration of the outcome of advance forecasts (1 to 3 or 4 days ahead) and for comparison the outcome of a type of "blind" forecast. For the latter the frequency for each quality grade, as determined from the distribution of quality grades in the four most recent months of the current season, is partitioned among the grades observed in the current month in proportion to the frequencies observed in the current month.

The radio propagation quality figures are prepared from radio traffic data reported to CRPL by American Telephone and Telegraph Company, Mackay Radio and Telegraph Company, RCA Communications, Inc., Marconi Company, British Admiralty Signal and Radar Establishment, and the following agencies of the U. S. government:--FCC, Coast Guard, Navy, Army Signal Corps, and State Department. The method of calculation, summarized below, is similar to that described in a 1946 report, IRPL-R31, now out of print. Beginning with recalculated figures for January 1952, only reports of radio transmission on North Atlantic paths closely approximating New York-London are included in the estimation of quality. Observations of selected ionospheric characteristics, even though strongly correlated with radio transmission quality, and traffic reports for paths such as New York-Stockholm or New York-Tangier, previously included in the quality-figure determination with low weight, have been left out of the present calculations inasmuch as a sufficient number of homogeneous reports are now available.

The original reports are submitted on various scales and for various time intervals. The observations for each 6-hour interval are averaged on the quality scale of the original reports. These 6-hour indices are then adjusted to the 1 to 9 quality-figure scale by a conversion table prepared by comparing the distribution of these indices for at least four months, usually a year.

with a master distribution determined from analysis of the reports originally made on the 1 to 9 quality-figure scale. A report whose distribution is the same as the master is thereby converted linearly to the Q-figure scale. The 6-hourly quality figures are (subjectively) weighted means of the reports received for that period. These 6-hourly quality figures replace, beginning January 1953, the half-daily quality figures which formerly appeared in this table.

These quality figures are, in effect, a consensus of reported radio propagation conditions in the North Atlantic area. The reasons for low quality are not necessarily known and may not be limited to ionospheric storminess. For instance, low quality may result from improper frequency usage for the path and time of day. Although, wherever it is reported, frequency usage is included in the rating of reports, it must often be an assumption that the reports refer to optimum working frequencies. It is more difficult to eliminate from the indices conditions of low quality because of multipath, interference, etc. These considerations should be taken into account in interpreting research correlations between the Q-figures and solar, auroral, geomagnetic or similar indices.

Note. The North Pacific quality figures, which were published through October 1951, have been temporarily discontinued. Since the establishment of the North Pacific Radio Warning Service at Anchorage, Alaska, a larger number of reports are being received than were previously available in Washington. The preparation of the quality figures will be resumed when sufficient data have been accumulated for determination of conversion tables for these new reports.

OBSERVATIONS OF THE SOLAR CORONA

Tables 75 through 77 give the observations of the solar corona during July 1953, obtained at Climax, Colorado, by the High Altitude Observatory of Harvard University and the University of Colorado. Tables 78 through 80 list the coronal observations obtained at Sacramento Peak, New Mexico, during July 1953, derived by Harvard College Observatory as a part of its performance of a research contract with the Upper Air Research Observatory, Geophysical Research Directorate, Air Force Cambridge Research Center. The data are listed separately for east and west limbs at 5-degree intervals of position angle north and south of the Solar Equator at the limb. The time of observation is given to the nearest tenth of a day, GCT.

Table 75 gives the intensities of the green (5303A) line of the emission spectrum of the solar corona; table 76 gives similarly the intensities of the first red (6374A) coronal line; and table 77, the intensities of the second red (6702A) coronal line; all observed at Climax in July 1953.

Table 78 gives the intensities of the green (5303A) coronal line; table 79, the intensities of the first red (6374A) coronal line; and table 80, the intensities of the second red (6702A) coronal line; all observed at Sacramento Peak in July 1952.

The following symbols are used in tables 75 through 80: a, observation of low weight; -, corona not visible; and X, position angle not included in plate estimates.

RELATIVE SUNSPOT NUMBERS

Table 81 lists the daily provisional Zürich relative sunspot number, R_Z, as communicated by the Swiss Federal Observatory. Table 82 continues the new series of American relative sunspot numbers, R_A'. Beginning with 1951, the observations collected by the Solar Division, AAVSO, have been reduced according to a new procedure, such that only high quality observations of experienced observers are combined into R_A'. Observatory coefficients for each of the 28 selected observers were recomputed on data for 1948-1950, years when there was a wide range of solar activity. Otherwise, the procedure is that outlined in Publication of the Astronomical Society of the Pacific, 61, 13, 1949. The scale of the American numbers in 1951 differs from that of the reports for earlier years because of these changes, and the new series is designated R_A' rather than R_A. The American relative sunspot numbers appear monthly in these pages as communicated by the Solar Division.

OBSERVATIONS OF SOLAR FLARES

Table 83 gives the preliminary record of solar flares reported to the CRPL. These reports are communicated on a rapid schedule at the sacrifice of detailed accuracy. Definitive and complete records are published later in the Quarterly Bulletin of Solar Activity, I.A.U., in various observatory publications, and elsewhere. The present listing serves to identify and roughly describe the phenomena observed. Details should be sought from the reporting observatory.

Reporting directly to the CRPL are the following observatories: Mt. Wilson, McMath-Hulbert, U. S. Naval, Wendelstein, Kanzel and High Altitude at Sacramento Peak, New Mexico. The remainder report to Meudon (Paris) and the data are taken from the Paris-URSIgram broadcast, monitored fairly regularly by the CRPL. The data on solar flares reported from Sacramento Peak, New Mexico, communicated by the High Altitude Observatory at Boulder, Colorado, are provided by Harvard University as the result of work undertaken on an Air Materiel Command Research and Development Contract administered by the Air Force Cambridge Research Laboratories.

The table lists for each flare the reporting observatory, date, times of beginning and ending of observation, duration (when known), total area (corrected for foreshortening), and heliographic coordinates. For the maximum phase of the flare is given the time, intensity, area relative to the total area, and the importance. The column "SID observed" is to indicate when a sudden ionosphere disturbance, noted elsewhere in these reports, occurred at the time of a flare. Times are in Universal Time (GCT).

INDICES OF GEOMAGNETIC ACTIVITY

Table 84 lists various indices of geomagnetic activity based on data from magnetic observatories widely distributed throughout the world. The indices are: (1) preliminary international character-figures, C; (2) geomagnetic planetary three-hour-range indices, Kp; (3) magnetically selected quiet and disturbed days. Table 85 lists Kp for the years 1937, 1938 and 1939.

The C-figure is the arithmetic mean of the subjective classification by all observatories of each day's magnetic activity on a scale of 0 (quiet) to 2 (storm). The magnetically quiet and disturbed days are selected by the international scheme outlined on pages 219-227 in the December 1943 issue of Terrestrial Magnetism and Atmospheric Electricity. The details of the currently used method follow. For each day of a month, its geomagnetic activity is assigned by weighting equally the following four criteria: (1) C; (2) the sum of the eight Kp's; (3) the greatest Kp; and (4) the sums of the squares of the eight Kp's.

Kp is the mean standardized K-index from 11 observatories between geomagnetic latitudes 47 and 63 degrees. The scale is 0 (very quiet) to 9 (extremely disturbed), expressed in thirds of a unit, e.g., 5- is 4 2/3, 5o is 5 0/3, and 5+ is 5 1/3. This planetary index is designed to measure solar particle-radiation by its magnetic effects, specifically to meet the needs of research workers in the ionospheric field. A complete description of Kp has appeared in Bulletin 12b, "Geomagnetic Indices C and K, 1948," published in Washington, D. C., 1949, by the Association of Terrestrial Magnetism and Electricity, International Union of Geodesy and Geophysics.

With the publication in this issue of Kp for 1937, 1938 and 1939 (Table 85), this geomagnetic index is complete back to the time systematic and detailed ionospheric observations began. The data for 1940-44 appear in F65, F66 and F67; for 1945-48 in Bulletin 12b of ATME; for 1949 in F67; and for 1950 to date monthly in these F-reports beginning with F68.

The Committee on Characterization of Magnetic Disturbance, ATME, IUGG, has kindly supplied these tables. The Meteorological Office, De Bilt, Holland, collects the data and compiles C and selected days. The Chairman of the Committee computes the planetary index. Current tables are also published quarterly in the Journal of Geophysical Research along with data on sudden commencements (sc) and solar flare effects (sfe).

SUDDEN IONOSPHERE DISTURBANCES

Table 86 shows that no sudden ionosphere disturbances were observed during the month of July 1953 at Washington, D. C.

TABLES OF IONOSPHERIC DATA

Table 1

Washington, D. C. (38.7°N, 77.1°W) July 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	(270)	2.8					2.6	3.0
01	(280)	2.6					2.1	3.0
02	(280)	2.4					1.8	3.0
03	(280)	2.2					2.5	(3.1)
04	(280)	2.0					2.4	3.0
05	260	2.6	---	---			3.0	3.2
06	(300)	3.3	220	3.0	120	2.0	3.7	3.3
07	G	< 3.6	210	3.4	110	2.4	3.7	G
08	G	< 3.8	210	3.8	110	2.6	4.4	G
09	G	< 4.1	200	4.0	100	2.9	5.2	G
10	440	(4.4)	200	4.0	100	3.0	4.6	(2.8)
11	G	< 4.2	200	4.1	100	3.0	5.2	G
12	G	< 4.3	200	4.2	100	3.2	4.8	G
13	520	(4.6)	200	4.2	100	3.2	4.4	G
14	G	(4.6)	200	4.1	100	3.2	4.1	G
15	430	4.7	210	4.0	100	3.1	4.4	2.8
16	360	4.8	210	3.9	110	2.9	4.2	3.0
17	350	4.8	220	3.7	110	2.6	3.7	3.0
18	300	4.8	220	3.4	110	2.2	4.2	3.1
19	250	4.9	220	---	---	---	3.2	3.2
20	240	5.0					3.2	3.1
21	250	4.6					2.7	3.0
22	250	3.8					2.9	3.0
23	260	3.3					2.3	3.0

Time: 75.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 2

Tromso, Norway (69.7°N, 19.0°E) June 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	(325)	4.1	---	--	---	---	4.1	(2.9)
01	310	4.2	---	---	---	---	4.1	3.0
02	310	4.2	250	---	100	---	3.9	3.0
03	330	4.1	240	3.2	105	1.8	3.2	3.0
04	345	4.2	230	3.4	100	2.0	3.2	3.0
05	390	4.2	210	3.6	100	2.2	3.2	3.0
06	400	4.4	215	3.6	100	2.4	3.0	2.9
07	395	4.5	210	3.8	100	2.4	3.0	2.9
08	380	4.7	210	3.9	100	2.6	3.2	3.0
09	380	4.8	205	4.0	100	2.7	3.2	3.0
10	395	4.8	210	4.0	100	2.3	3.3	2.9
11	390	4.7	210	4.1	100	2.8	3.1	3.0
12	390	4.7	210	4.1	100	2.8	3.2	3.0
13	410	4.6	200	4.1	100	2.8	3.1	3.0
14	430	4.6	210	4.0	100	2.8	3.2	2.9
15	390	4.5	205	4.0	100	2.8	3.0	3.0
16	385	4.5	215	3.9	100	2.6	3.0	3.0
17	350	4.5	225	3.8	100	2.4	3.4	3.1
18	335	4.4	230	3.6	105	2.3	3.8	3.2
19	310	4.3	240	3.5	110	2.1	4.1	3.2
20	(315)	4.2	240	---	110	1.8	4.0	3.1
21	---	4.0	245	---	110	---	3.6	3.1
22	---	4.2	---	---	---	---	3.9	(3.1)
23	---	(4.0)	---	---	---	---	4.1	(3.0)

Time: 15.0°E.
Sweep: 0.6 Mc to 25.0 Mc in 5 minutes, automatic operation.

Table 3

Fairbanks, Alaska (64.9°N, 147.8°W) June 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	3.6					3.6	3.0
01	300	3.9					4.2	3.0
02	300	3.8	270	---			5.0	3.0
03	320	3.8	240	---			4.8	3.0
04	360	3.9	220	3.1			4.0	3.0
05	370	4.0	230	3.3	---	---		2.8
06	380	4.1	210	3.5	---	---		2.9
07	390	4.3	200	3.7	---	---		2.8
08	410	4.3	200	3.7	---	---		2.8
09	420	4.4	200	3.9	---	---		2.8
10	440	4.4	200	3.9	---	---		2.7
11	420	4.4	210	3.9	---	---		2.8
12	420	4.5	200	4.0	---	---		2.8
13	470	4.4	200	3.9	---	---		2.7
14	440	4.4	200	4.0	---	---		2.6
15	420	4.3	200	3.8	---	---		2.8
16	390	4.4	210	3.8	---	---		2.9
17	360	4.4	220	3.7	---	---		3.0
18	330	4.4	220	3.5	---	---		3.0
19	300	4.4	230	3.3	---	---		3.1
20	270	4.4	240	---	---	---		3.2
21	260	4.2	---	---	---	---		3.2
22	260	4.0						3.2
23	260	3.8						3.1

Time: 150.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 4

Anchorage, Alaska (61.2°N, 149.9°W) June 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	3.4					2.2	3.0
01	270	3.0					3.2	3.0
02	290	3.0					1.8	3.0
03	330	3.4	260	2.5	130	1.4	2.6	2.9
04	400	3.7	240	2.9	110	1.7	3.0	2.8
05	400	3.9	230	3.3	100	2.1	3.4	2.8
06	420	4.2	210	3.5	100	2.3	3.0	2.8
07	420	4.3	210	3.7	100	2.6		2.8
08	420	4.5	210	3.8	100	2.8		2.7
09	430	4.5	210	3.9	100	2.9		2.8
10	460	4.5	210	4.0	100	2.9		2.7
11	440	4.6	210	4.0	100	3.0	3.2	2.8
12	480	4.5	200	4.0	100	3.0		2.6
13	530	4.5	210	4.1	100	3.0		2.4
14	500	4.5	210	4.0	100	3.0		2.6
15	460	4.4	210	4.0	100	2.8		2.7
16	450	4.3	200	3.9	100	2.8		2.7
17	400	4.4	210	3.8	100	2.6		2.8
18	360	4.4	220	3.6	110	2.4		3.0
19	320	4.5	230	3.4	110	2.1	2.4	3.0
20	290	4.4	240	3.0	120	1.7	2.8	3.1
21	260	4.4	240	---	---	---	2.4	3.1
22	250	4.2					2.9	3.1
23	260	3.6					2.6	3.0

Time: 150.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 5

Narsarssuak, Greenland (61.2°N, 45.4°W) June 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	(3.5)					5.2	(2.9)
01	300	(3.4)					4.7	(2.9)
02	(300)	(3.4)					4.7	(3.0)
03	(300)	(3.4)					4.9	(3.2)
04	---	(3.6)	---	---	--	---	4.8	(3.0)
05	(280)	(3.9)	220	---	---	---	4.0	(3.2)
06	380	(4.2)	240	3.6	100	2.5	4.9	3.1
07	420	4.4	210	3.8	100	2.7	4.1	3.1
08	390	4.4	200	4.0	100	2.8	3.4	3.0
09	420	4.5	200	4.0	100	3.0		2.8
10	400	4.6	200	4.1	100	3.0		2.9
11	420	4.6	200	4.1	100	3.0		2.8
12	460	4.6	200	4.2	100	3.1		2.7
13	430	4.7	200	4.2	100	3.1		2.7
14	420	4.8	200	4.1	100	3.0		2.8
15	400	4.7	200	4.1	100	2.9	3.2	2.8
16	390	(4.7)	210	4.0	100	(2.8)	4.0	(2.9)
17	370	(4.6)	240	3.9	100	2.6	4.1	(2.9)
18	350	(4.4)	240	(3.7)	100	2.4	4.5	3.0
19	(340)	(4.2)	240	(3.4)	110	2.0	5.4	(2.9)
20	(300)	(4.0)	260	---	---	---	4.8	(3.0)
21	290	(4.0)			---	---	6.6	(3.1)
22	(280)	(3.5)					5.4	(3.0)
23	280	(3.7)					7.0	(3.1)

Time: 45.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 30 seconds.

Table 6

Oslo, Norway (60.0°N, 11.1°E) June 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	260	4.0						3.3
01	250	3.6			---	---		3.2
02	260	3.5	---	---	120	1.1	2.3	3.2
03	(265)	3.6	250	---	100	1.3	2.2	3.3
04	(300)	3.7	240	---	100	1.6	2.8	3.3
05	350	4.0	220	3.3	100	1.8	4.0	3.2
06	340	4.2	220	3.6	100	2.2	4.0	3.3
07	360	4.4	210	3.8	100	2.4	4.0	3.3
08	400	4.5	200	3.9	100	2.7	4.2	3.2
09	400	4.6	200	4.0	100	2.8	4.6	3.2
10	400	4.7	200	4.1	100	2.9	4.4	3.2
11	360	5.0	200	4.2	100	2.9	4.6	3.4
12	400	4.8	200	4.2	100	3.0	4.2	3.2
13	380	4.8	200	4.2	100	3.0	4.4	3.3
14	400	4.8	200	4.2	100	3.0	3.8	3.2
15	420	4.7	200	4.1	100	2.9	4.1	3.2
16	360	4.7	200	4.0	100	2.8	3.8	3.2
17	350	4.8	220	3.8	100	2.6	4.2	3.3
18	330	4.8	220	3.7	100	2.4	4.0	3.4
19	300	4.9	230	3.4	100	2.1	3.9	3.4
20	270	4.9	240	---	110	1.7	3.7	3.4
21	260	4.8	250	---	130	---	1.7	3.4
22	250	4.6						3.4
23	250	4.4						3.5

Time: 15.0°E.
Sweep: 0.6 Mc to 14.0 Mc in 8 minutes, automatic operation.

Table 7

Upsala, Sweden (59.8°N, 17.6°E) June 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	255	3.8						3.0
01	260	3.4					2.6	3.0
02	270	3.2			---	E	3.0	3.0
03	270	3.4	240	2.5	---	E	3.0	3.1
04	350	3.7	230	3.0	130	1.6	3.6	3.0
05	375	4.1	225	3.4	115	2.0	4.3	3.0
06	375	4.4	220	3.6	110	2.2	3.8	3.0
07	400	4.4	215	3.8	110	2.5	4.4	2.9
08	415	4.6	210	4.0	105	2.7	5.1	2.9
09	395	4.8	205	4.0	105	2.8	4.6	3.0
10	370	5.0	205	4.1	105	2.9	4.6	3.0
11	385	5.1	200	4.2	105	2.9	5.1	3.0
12	385	4.9	210	4.2	105	3.0	4.6	3.0
13	395	4.8	210	4.2	105	2.9	4.0	3.0
14	395	4.7	210	4.1	105	2.8	4.7	2.9
15	415	4.6	210	4.1	105	2.8	4.2	2.9
16	380	4.7	215	4.0	105	2.7	3.8	3.0
17	355	4.8	215	3.8	110	2.4	3.9	3.0
18	315	4.8	225	3.6	110	2.2	4.1	3.1
19	280	4.9	235	3.2	120	1.9	4.2	3.2
20	265	4.9	240	2.7	125	1.5	3.4	3.2
21	255	4.8			---	E		3.1
22	250	4.8						3.1
23	250	4.8					2.1	3.1

Time: 15.0°E.
Sweep: 1.4 Mc to 17.0 in 6 minutes, automatic operation.

Table 8

Adak, Alaska (51.9°N, 176.6°W) June 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	4.3					2.5	2.9
01	280	4.0					3.0	2.9
02	290	3.9					2.4	2.9
03	300	3.8	---	---	---	E	2.7	2.9
04	360	3.8	270	2.6	140	1.5	2.3	2.8
05	390	4.2	250	3.2	120	1.9	3.4	2.8
06	400	4.4	240	3.6	110	2.3	3.1	2.8
07	400	4.7	240	3.8	110	2.6	6.9	2.8
08	400	4.8	220	4.0	110	2.8	6.8	2.8
09	440	4.7	210	4.0	110	3.0	6.4	2.7
10	450	4.7	220	4.0	110	3.1	7.5	2.7
11	400	4.9	210	4.1	110	3.1	7.1	2.9
12	450	4.8	220	4.2	110	3.1	7.3	2.7
13	420	4.7	220	4.2	110	3.1	6.4	2.9
14	460	4.4	210	4.1	110	3.0	7.0	2.7
15	430	4.5	220	4.0	110	2.9	7.2	2.8
16	400	4.6	230	3.9	110	2.7	5.6	2.9
17	370	4.7	240	3.8	110	2.5	4.8	3.0
18	350	4.6	240	3.5	120	2.2	4.4	3.0
19	310	5.0	250	---	130	1.8	4.4	3.0
20	280	5.6					3.6	3.0
21	260	6.0					4.0	3.1
22	260	5.6					4.0	3.0
23	270	4.7					3.4	2.9

Time: 180.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 30 seconds.

Table 9

Graz, Austria (47.1°N, 15.5°E) June 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	4.2						
01	280	3.9						
02	280	3.8						
03	280	3.3						
04	280	3.3						
05	250	4.0	(245)	3.3				
06	300	4.5	220	3.5			4.1	
07	310	5.0	205	3.9	---	2.7	4.6	
08	300	5.0	200	4.0	---	---	4.8	
09	300	5.1	200	4.1	---	3.0	5.0	
10	300	5.4	190	4.2	---	---	5.0	
11	300	5.2	200	4.4	---	---	5.0	
12	305	5.2	200	4.3	---	3.4	4.7	
13	330	5.1	200	4.3	---	3.4	4.0	
14	300	5.2	195	4.2	---	3.4	4.2	
15	340	5.0	200	4.1	---	3.2	4.9	
16	330	5.1	200	4.0	---	3.1	4.0	
17	300	5.1	200	3.8	---	2.8	4.9	
18	290	5.4	230	3.5			4.0	
19	260	5.9					4.0	
20	240	6.1					4.0	
21	245	5.9					5.0	
22	240	5.1					4.4	
23	250	4.3					3.8	

Time: 15.0°E.
Sweep: 2.5 Mc to 12.0 Mc in 2 minutes.

Table 10

San Francisco, California (37.4°N, 122.2°W) June 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	(250)	(3.4)					4.3	(3.1)
01	(270)	(3.5)					4.1	(3.1)
02	(280)	(3.3)					3.8	(3.1)
03	(270)	(3.2)					3.0	(3.1)
04	(280)	(3.2)					3.8	(3.1)
05	(300)	3.2	250	---	---	---	3.7	3.2
06	380	(3.9)	230	3.2	110	2.0	4.1	3.1
07	380	4.4	220	(3.6)	110	(2.5)	4.5	3.0
08	350	4.8	(200)	(3.8)	110	(2.8)	5.7	3.1
09	390	5.0	(200)	(4.0)	100	(2.9)	6.9	2.8
10	360	5.1	(200)	(4.2)	100	(3.1)	5.8	3.0
11	400	5.2	(190)	4.2	100	(3.2)	5.6	2.9
12	380	5.1	200	(4.2)	100	(3.2)	5.7	2.9
13	410	5.1	200	4.2	100	(3.2)	5.0	2.9
14	380	5.3	210	4.1	100	(3.1)	5.4	2.9
15	360	5.4	210	(4.0)	110	(3.0)	4.5	3.0
16	340	5.2	210	(3.9)	110	(2.8)	4.4	3.1
17	320	5.2	210	(3.7)	110	(2.5)	4.8	3.1
18	310	5.0	220	(3.5)	110	2.1	3.9	3.2
19	260	5.0	240	---			3.1	3.2
20	(240)	5.5					3.1	3.2
21	(240)	(5.2)					4.8	(3.2)
22	(250)	(4.6)					4.8	(3.2)
23	(260)	(3.8)					4.2	(3.1)

Time: 120.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 11

White Sands, New Mexico (32.3°N, 106.6°W) June 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	3.4					3.4	3.0
01	280	3.4					2.6	3.0
02	260	3.4					2.4	3.0
03	270	3.3					2.4	3.0
04	270	3.1					2.8	3.0
05	250	3.3					2.7	3.2
06	280	4.1	220	3.1	110	1.9	3.6	3.2
07	340	4.3	210	3.7	100	2.5	4.1	3.0
08	320	5.4	200	4.0	100	2.8	4.4	3.0
09	360	5.3	200	4.2	100	3.0	4.7	3.0
10	400	5.5	190	4.3	100	3.2	5.2	2.9
11	410	5.4	200	4.4	100	3.2	4.8	2.8
12	380	5.4	200	4.4	110	3.2	4.4	2.8
13	330	5.6	190	4.3	110	3.2		2.8
14	360	5.7	200	4.3	110	3.2	4.2	2.9
15	350	5.6	200	4.2	110	3.0	4.2	3.0
16	330	5.6	210	4.0	110	2.9	4.2	3.0
17	310	5.6	220	3.8	110	2.6	3.6	3.0
18	290	5.6	230	3.3	110	2.0	4.3	3.1
19	260	5.6					3.4	3.2
20	230	6.0					3.6	3.2
21	240	4.8					3.3	3.2
22	250	4.0					3.4	3.1
23	260	3.6					3.7	3.1

Time: 105.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 30 seconds.

Table 12

Baton Rouge, Louisiana (30.5°N, 91.2°W) June 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	3.3					3.3	3.1
01	300	3.3					3.5	3.1
02	280	3.2					2.3	3.1
03	280	3.0					3.3	3.1
04	300	2.8					2.6	3.1
05	280	3.0					2.6	3.2
06	290	4.1	230	---	120	(2.1)	3.0	3.3
07	340	4.6	220	3.6	110	(2.4)	4.1	3.1
08	330	5.0	210	4.0	110	(2.6)	5.2	3.1
09	370	5.2	200	4.1	110	2.9	6.0	2.9
10	400	5.1	200	4.2	110	3.1	5.5	2.9
11	420	5.0	200	4.2	110	3.2	5.0	2.8
12	420	5.2	200	4.2	110	3.2	5.0	2.8
13	380	5.3	200	4.2	110	(3.3)	4.4	3.0
14	370	5.6	200	4.1	110	(3.2)	4.2	3.0
15	340	5.8	220	4.1	110	(3.0)	4.3	3.0
16	330	5.6	220	4.0	110	(2.8)	4.3	3.1
17	310	5.6	220	3.7	110	2.5	4.1	3.1
18	290	5.5	230	3.2	120	2.1	3.8	3.2
19	240	5.6					3.1	3.2
20	240	5.5						3.2
21	260	4.3					2.7	3.2
22	270	3.7					3.2	3.1
23	290	3.3					4.0	3.1

Time: 90.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 30 seconds.

Table 13

Okinawa I. (26.3°N, 127.8°E) June 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	4.9					5.0	3.0
01	270	5.0					4.6	3.1
02	260	4.5					4.2	3.2
03	260	4.0					4.0	3.2
04	240	3.6					3.6	3.2
05	260	3.4					4.0	3.3
06	270	4.6	240	---	110	1.9	3.9	3.4
07	280	5.4	220	---	110	2.4	5.0	3.4
08	290	5.4	220	4.2	110	2.7	5.8	3.3
09	340	6.2	210	4.3	110	2.8	6.8	3.2
10	400	5.6	210	4.4	110	3.1	5.4	2.9
11	390	6.2	220	4.4	110	3.2	7.0	2.8
12	370	6.6	230	4.5	110	3.2	6.6	2.8
13	380	7.3	240	4.4	110	3.2	6.0	2.8
14	360	7.9	230	4.3	110	3.1	5.3	2.8
15	330	8.6	230	4.2	110	3.0	6.0	2.9
16	320	8.8	230	4.0	110	2.8	5.0	3.0
17	280	9.3	230	3.8	110	2.4	5.2	3.2
18	260	8.3					5.2	3.2
19	250	6.8					4.6	3.1
20	260	5.8					3.9	3.1
21	280	5.4					4.3	3.0
22	300	4.8					4.4	2.9
23	310	4.8					4.7	2.8

Time: 127.5°E.
Sweep: 1.0 Mc to 25.0 Mc in 16 seconds.

Table 14

Maui, Hawaii (20.8°N, 156.5°W) June 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	5.2					2.5	3.0
01	280	5.4					2.6	3.0
02	260	5.0					2.7	3.1
03	260	4.7					2.2	(3.1)
04	250	4.4					2.6	3.1
05	260	3.7					2.0	3.1
06	260	3.9	250	---	130	1.6	2.4	3.2
07	300	4.9	220	3.6	110	2.2	4.4	3.2
08	340	5.2	210	4.0	110	2.7	5.0	2.9
09	430	5.4	210	4.2	110	3.0	5.4	2.7
10	450	5.9	200	4.3	110	3.2	5.7	2.6
11	450	6.6	200	4.4	110	3.3	6.2	2.5
12	410	7.6	200	4.4	110	3.4	4.8	2.6
13	380	8.5	200	4.3	110	3.4	5.0	2.7
14	350	9.0	210	4.3	110	3.3	4.3	2.9
15	340	9.4	220	4.2	110	(3.2)	4.6	2.9
16	320	9.8	220	4.0	110	3.0	4.2	3.0
17	290	9.6	230	3.9	110	2.6	5.4	3.1
18	270	10.0	230	(3.5)	110	2.0	4.1	3.2
19	250	9.0	---	---	---	---	4.4	3.2
20	240	7.4					4.0	3.1
21	250	6.6					4.0	3.0
22	260	6.0					3.8	3.0
23	280	5.7					2.6	2.9

Time: 150.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 15

Puerto Rico, W.I. (18.5°N, 67.2°W) June 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	4.4					2.2	3.1
01	260	4.4					2.5	3.2
02	250	4.4					2.5	3.2
03	240	3.8					2.2	3.3
04	250	3.4					2.4	3.2
05	250	3.2						3.2
06	240	3.5	220	---	100	---	2.9	3.4
07	280	4.5	210	3.5	100	2.1	3.6	3.3
08	280	5.4	200	3.9	90	2.6	3.8	3.4
09	320	5.4	190	4.1	90	3.0	4.4	3.2
10	360	5.6	200	4.2	90	3.2	4.8	3.0
11	350	5.9	200	4.3	90	3.3		3.0
12	360	6.4	200	4.4	90	3.4	4.4	2.9
13	340	7.4	200	4.4	90	3.4		2.9
14	320	7.6	200	4.3	100	3.3		3.0
15	300	7.8	210	4.2	100	3.2		3.0
16	300	8.4	210	4.0	100	3.0	4.8	3.1
17	280	8.2	210	3.9	100	2.6	4.8	3.2
18	250	8.2	220	3.3	100	---	4.2	3.3
19	220	6.9					4.6	3.4
20	220	6.0					3.3	3.2
21	240	5.2					3.2	3.2
22	250	4.7					2.5	3.2
23	260	4.4					2.7	3.1

Time: 60.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 16

Guam I. (13.6°N, 144.9°E) June 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	340	(3.3)						2.9
01	(330)	3.0						2.8
02	340	2.4						2.9
03	340	(2.4)					2.0	(3.0)
04	290	---					2.4	---
05	250	2.3						3.4
06	250	3.7					2.0	3.4
07	250	6.2	230	---	120	---	2.9	3.3
08	270	6.8	220	3.7	(110)	---	4.0	3.4
09	330	5.7	210	4.1	110	2.9	7.0	3.1
10	400	6.1	220	4.2	110	3.1	6.8	2.8
11	420	6.4	210	4.3	110	3.3	7.6	2.6
12	420	7.2	200	4.3	110	3.3	6.9	2.6
13	410	7.3	200	4.3	110	3.3	7.0	2.5
14	420	7.5	200	4.2	110	3.2	7.0	2.5
15	390	7.8	210	4.1	110	(3.1)	7.1	2.5
16	380	8.0	220	4.0	110	2.9	6.9	2.6
17	340	8.1	230	3.8	120	2.6	4.9	2.8
18	280	8.5	230	---	---	---	4.5	2.9
19	250	8.2					4.2	3.1
20	250	6.9					3.6	3.1
21	270	5.6						3.0
22	300	4.4					2.5	2.9
23	330	3.9					2.6	3.0

Time: 150.0°E.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 17

Panama Canal Zone (9.4°N, 79.9°W) June 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	4.9						2.9
01	260	4.2						2.8
02	260	4.1						2.9
03	280	3.6						2.9
04	270	3.3						2.9
05	260	3.3					2.4	3.0
06	260	3.6			---	---	3.9	3.0
07	260	4.6	230	3.5	120	(2.2)	4.1	3.0
08	320	5.1	210	4.0	110	2.7	4.6	2.9
09	440	5.3	220	4.2	110	3.0	4.4	2.6
10	450	5.6	220	4.2	110	3.2	4.2	2.4
11	460	6.8	220	4.3	110	3.3	4.8	2.5
12	420	7.8	220	4.3	110	3.4	4.4	2.5
13	400	8.7	220	4.3	110	3.4	4.5	2.6
14	380	9.2	220	4.3	110	3.3	4.6	2.7
15	360	9.8	220	4.2	110	3.1	4.4	2.7
16	330	10.1	220	4.0	110	2.8	4.7	2.8
17	300	9.8	230	3.8	120	(2.5)	3.8	2.9
18	270	9.1	240	(3.2)	(130)	(1.9)	3.0	2.9
19	250	8.2					3.3	3.0
20	250	7.0					3.0	2.6
21	270	6.3					2.6	2.8
22	270	5.6					2.3	2.9
23	270	5.2					2.0	2.9

Time: 75.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 18

Kiruna, Sweden (67.8°N, 20.5°E) May 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	4.0					3.2	3.1
01	280	3.8					3.2	3.1
02	285	3.9	---	---	---	---	2.1	3.1
03	305	4.0	240	3.0	---	---		2.9
04	330	4.1	230	3.2	110	2.1		2.9
05	380	4.2	245	3.4	110	2.2		2.9
06	370	4.2	230	3.7	110	2.5		3.0
07	380	4.5	220	3.8	110	2.7		3.0
08	390	4.6	215	3.9	105	2.8		3.0
09	385	4.5	210	4.0	105	2.9		3.0
10	350	4.9	205	4.0	105	3.0		3.1
11	360	4.9	210	4.1	105	3.1		3.1
12	380	4.4	210	4.1	105	3.1		3.0
13	400	(4.4)	210	4.0	105	3.1		2.9
14	360	(4.4)	205	4.0	105	3.0		(3.1)
15	360	4.3	210	3.9	108	2.9		3.0
16	350	4.4	210	3.9	110	2.8		3.1
17	320	4.5	230	3.8	110	2.5		3.2
18	295	4.5	240	3.5	110	2.2	2.2	3.2
19	280	4.3	240	3.2	---	2.0	2.?	3.2
20	250	4.2	---	---	---	---	2.2	3.2
21	250	4.0					3.6	3.2
22	255	4.0					3.0	3.2
23	260	4.0					3.1	3.2

Time: 15.0°E.
Sweep: 0.8 Mc to 15.0 Mc in 30 seconds.

Table 19

De Bilt, Holland (52.1°N, 5.2°E) May 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	3.5						3.0
01	280	3.1						3.0
02	280	3.0						3.0
03	280	2.9						3.0
04	260	3.2	---	---	---	E	2.2	3.1
05	250	3.7	215	3.3	110	2.0	2.6	3.3
06	310	<4.2	210	3.5	105	2.2	2.7	3.1
07	325	4.8	210	3.8	100	2.5	3.6	3.2
08	355	4.7	205	3.9	100	2.7	3.8	3.1
09	330	5.0	200	4.0	100	2.9	4.2	3.1
10	365	5.1	200	4.2	100	3.0	4.5	3.1
11	355	5.1	200	4.2	100	3.0	4.4	3.1
12	360	5.1	200	4.2	100	3.1	4.1	3.0
13	330	5.0	200	4.2	100	3.1	3.6	3.1
14	370	5.0	200	4.2	100	3.0	3.6	3.0
15	350	5.0	200	4.0	100	2.9	3.2	3.0
16	320	5.2	210	3.9	100	2.7	3.2	3.1
17	300	5.2	225	3.6	105	2.3	3.2	3.1
18	280	5.5	225	3.3	110	2.0	3.1	3.2
19	240	5.7	---	---	---	E	2.6	3.3
20	220	5.6						3.2
21	220	4.9						3.2
22	230	4.0						3.1
23	265	3.8						3.0

Time: 0.0°.
Sweep: 1.4 Mc to 11.2 Mc in 6 minutes, automatic operation.

Table 20

Schwarzenburg, Switzerland (46.8°N, 7.3°E) May 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	260	3.6						3.3
01	290	3.4						3.1
02	290	3.2						3.2
03	285	3.0						3.2
04	280	3.2						3.2
05	250	3.3			---	---		3.4
06	230	4.0	210	3.0	100	2.0		3.5
07	290	4.6	200	3.6	100	2.3		3.5
08	300	5.0	200	3.8	100	2.6	4.1	3.4
09	300	5.0	200	3.9	100	2.8	4.0	3.4
10	310	5.0	200	4.0	100	3.0	4.5	3.4
11	305	5.3	200	4.1	100	3.0	4.0	3.3
12	325	5.0	200	4.1	100	3.0		3.3
13	365	5.0	200	4.1	100	3.0		3.1
14	325	5.2	200	4.1	100	3.0		3.2
15	320	5.2	200	4.0	100	3.0		3.4
16	310	5.2	200	4.0	100	2.9	4.0	3.3
17	300	5.4	200	3.8	100	2.6		3.4
18	300	5.7	200	3.5	100	2.3		3.3
19	250	5.8	230	3.0	100	1.8	2.9	3.5
20	230	6.5						3.6
21	210	6.0						3.5
22	215	5.0						3.5
23	250	4.0						3.4

Time: 15.0°E.
Sweep: 1.0 Mc to 25.0 Mc in 30 seconds.

Table 21

Baton Rouge, Louisiana (30.5°N, 91.2°W) May 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	3.1					2.7	3.0
01	300	3.1					2.4	3.0
02	290	3.1					2.2	3.1
03	270	3.0					2.0	3.1
04	280	3.0						3.1
05	260	3.0					2.4	3.2
06	260	4.0	240	---	120	(1.9)	3.0	3.4
07	320	4.7	220	3.6	110	2.3	3.9	3.2
08	340	4.9	210	3.6	110	2.7	4.0	3.0
09	340	5.2	200	4.0	110	2.9	4.8	3.1
10	360	5.5	210	4.2	110	3.0	4.8	3.0
11	380	5.8	200	4.2	110	3.2	4.4	2.9
12	340	6.0	210	4.2	110	3.2	4.6	3.0
13	340	6.3	220	4.2	110	3.2	4.7	3.0
14	330	6.6	220	4.1	110	3.2	4.5	3.0
15	330	6.0	220	4.0	110	3.0	4.2	3.1
16	310	5.8	230	3.8	110	2.8	4.1	3.1
17	300	5.8	230	3.6	110	2.4	4.1	3.2
18	270	6.1	240	---	110	---	4.1	3.3
19	240	5.6					3.6	3.4
20	240	5.3					3.8	3.4
21	250	4.1					3.0	3.3
22	280	3.4					3.2	3.1
23	300	3.2						3.0

Time: 90.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 30 seconds.

Table 22

Formosa, China (25.0°N, 121.5°E) May 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	5.3					5.4	(3.0)
01	240	5.6					4.2	3.2
02	240	4.4					4.0	3.4
03	240	3.7					3.6	3.4
04	270	3.5					3.1	2.9
05	260	3.5					3.0	3.2
06	230	5.2			110	2.0	3.8	3.5
07	270	5.7	240	3.9	110	(2.4)	5.2	3.4
08	280	6.0	230	4.1	110	2.9	6.3	3.2
09	320	6.0	230	4.3	110	(3.1)	6.2	3.1
10	360	6.9	210	4.5	110	(3.2)	6.3	2.8
11	360	8.4	220	4.5	110	---	7.9	2.8
12	350	9.5	200	4.5	110	---	5.9	2.9
13	340	10.8	240	4.5	100	---	5.8	3.1
14	320	>11.3	220	4.5	110	(3.4)	4.9	3.2
15	320	>11.4	210	4.3	100	3.1	4.5	3.2
16	280	>11.7	230	4.2	110	2.9	4.6	3.2
17	280	10.5	230	3.8	100	---	4.8	3.4
18	240	9.6			---	---	4.6	3.2
19	240	7.4					4.0	3.2
20	260	6.2					4.4	3.0
21	280	5.8					5.5	3.0
22	320	5.5					5.8	2.9
23	300	5.2					4.4	2.8

Time: 120.0°E.
Sweep: 1.1 Mc to 19.5 Mc in 15 minutes, manual operation.

Table 23

Baguio, P.I. (16.4°N, 120.6°E) May 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	5.0					2.9	2.9
01	250	4.8					4.1	3.3
02	230	4.4					3.0	3.3
03	240	3.0					3.0	3.2
04	250	3.0					3.4	3.2
05	(250)	2.2					4.1	3.2
06	240	4.9					4.2	3.4
07	230	5.9	---	---	110	2.4	5.5	3.2
08	(300)	6.5	220	---	100	2.7	5.6	3.0
09	350	7.0	200	(4.2)	110	(3.0)	6.4	2.7
10	400	7.7	200	4.2	110	(3.1)	5.7	2.5
11	400	8.3	200	4.3	110	(3.2)	6.6	2.4
12	400	8.6	200	4.3	110	3.3	6.0	2.4
13	380	8.6	190	4.2	110	(3.4)	4.4	2.4
14	360	8.8	200	4.2	110	3.2	4.5	2.5
15	340	9.0	210	4.0	100	3.1	4.6	2.6
16	310	9.3	210	---	100	(2.7)	3.8	2.8
17	260	9.5	230	---	110	2.3	3.7	3.0
18	250	9.8					4.0	3.1
19	230	8.8					3.2	3.1
20	260	7.1					2.8	3.0
21	290	6.1					2.6	2.8
22	300	5.3					2.5	2.8
23	320	4.8					2.4	2.7

Time: 120.0°E.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 24

Leopoldville, Belgian Congo (4.3°S, 15.3°E) May 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M2000) F2
00	230	4.4					2.4	2.2
01	220	4.2					2.4	2.4
02	225	3.3					3.2	2.4
03	(220)	3.4					2.5	2.4
04	(235)	(2.3)					2.5	(2.4)
05	240	3.6			---	1.6	2.3	2.4
06	240	5.6	240	---	125	2.2	3.0	2.6
07	270	6.4	225	4.0	120	2.7	3.3	2.5
08	290	7.1	215	4.2	120	3.1	3.8	2.4
09	300	7.6	205	4.3	115	3.3	3.6	2.2
10	300	8.0	200	4.4	115	3.4		2.2
11	305	9.4	200	4.3	115	3.4		2.1
12	310	11.0	200	4.4	115	3.4	3.6	2.1
13	305	10.8	200	4.2	115	3.2	3.5	2.2
14	280	10.7	225	4.0	120	3.0	3.8	2.2
15	275	10.6	245	---	120	2.6	3.6	2.2
16	260	10.7	245	---	125	2.0	3.0	2.3
17	225	10.5					3.0	<2.5
18	215	8.2					2.7	2.6
19	205	5.6					2.4	2.6
20	215	4.2					1.8	2.4
21	235	4.0					2.0	2.1
22	250	4.0					2.4	2.2
23	245	4.5					2.4	2.2

Time: 0.0°.
Sweep: 1.0 Mc to 16.0 Mc in 7 seconds.

Table 25

Huancayo, Peru (12.0°S, 75.3°W) May 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	230	4.8						3.3
01	230	4.5						3.3
02	240	3.9						3.4
03	240	3.2						3.3
04	250	2.4						3.3
05	270	2.0						3.2
06	280	2.6			---	E		3.0
07	(260)	5.3	230	---	120	2.1	5.8	3.3
08	(300)	6.7	220	---	110	2.5	9.4	3.0
09	320	7.3	210	4.1	110	---	11.5	2.7
10	350	6.8	200	4.2	110	---	11.8	2.6
11	370	6.6	200	4.3	110	---	12.0	2.6
12	380	6.4	200	4.3	110	---	12.0	2.6
13	370	6.6	190	4.2	110	---	12.0	2.6
14	360	6.6	190	4.2	110	---	11.6	2.6
15	320	6.8	200	4.1	110	---	10.6	2.7
16	(290)	7.0	210	---	110	---	9.2	2.7
17	250	7.2	240	---	120	2.0	5.7	2.9
18	260	7.1			---	---	4.7	2.9
19	280	6.5						2.9
20	270	6.1						2.9
21	250	6.2						3.1
22	220	6.0						3.3
23	230	5.0						3.3

Time: 75.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 26

Watheroo, W. Australia (30.2°S, 115.9°E) May 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	250	3.4					2.0	3.0
01	250	3.4					1.4	3.1
02	240	3.6					1.8	3.2
03	240	3.6					1.4	3.2
04	230	3.6						3.4
05	210	3.4						3.4
06	220	2.9						3.3
07	220	3.8	---	---		1.5		3.5
08	230	5.2	200	2.9		2.1	3.0	3.6
09	240	5.7	200	3.7		2.5	3.3	3.5
10	250	5.9	200	4.1		2.8	3.6	3.4
11	270	6.1	200	4.2		3.0	3.8	3.3
12	270	6.4	200	4.3		3.0	3.9	3.3
13	270	6.0	200	4.2		3.0	3.8	3.3
14	260	6.4	200	4.1		2.9	3.8	3.4
15	250	6.5	210	3.8		2.7	3.7	3.4
16	230	6.2	220	3.4		2.4	3.5	3.5
17	210	5.3	220	2.3		1.8	3.0	3.5
18	210	4.0					3.2	3.5
19	210	2.9					2.8	3.3
20	230	2.8					2.1	3.2
21	230	2.9					2.0	3.1
22	250	3.0					2.0	3.0
23	250	3.2					2.1	3.1

Time: 120.0°E.
Sweep: 1.0 Mc to 16.0 Mc in 2 minutes.

Table 27

Resolute Bay, Canada (74.7°N, 94.9°W) April 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	260	3.1			---	---		3.0
01	260	3.0			---	---		3.0
02	260	3.2			---	1.6		3.0
03	260	3.3	---	---	130	1.6		2.9
04	260	3.4	---	---	130	1.5		3.0
05	250	3.3	240	---	120	1.7		3.0
06	260	3.5	240	3.1	120	1.8		3.0
07	400	3.4	240	3.0	110	2.0		3.0
08	0	3.6	230	3.2	110	2.2		2.6
09	0	<3.7	230	3.4	110	2.3		2.5
10	0	<3.7	220	3.4	110	2.4		0
11	0	<3.6	220	3.4	110	2.5		0
12	0	<3.6	220	3.5	110	2.6		0
13	0	<3.7	210	3.6	110	2.5		0
14	0	3.7	220	3.5	110	2.6		0
15	0	<3.6	220	3.4	110	2.3		0
16	430	4.0	220	3.3	110	2.3		2.8
17	370	3.9	230	3.2	110	2.1		2.9
18	320	3.8	230	3.0	110	1.9		2.9
19	270	3.9	250	3.0	120	1.8		3.0
20	250	3.8	240	---	120	1.6		3.0
21	250	3.8			120	1.5		3.0
22	250	3.5			140	1.5		3.0
23	260	3.6			---	---		2.9

Time: 90.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 28

Baker Lake, Canada (64.3°N, 96.0°W) April 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	230	3.1			---	E	4.0	3.0
01	230	3.7			---	E	4.0	3.0
02	230	2.6			---	E	4.0	3.0
03	240	2.4			---	E	4.0	3.0
04	240	2.5	---	---	---	1.3	4.0	3.0
05	250	2.8	---	---	100	1.8	6.2	3.0
06	230	3.1	200	2.8	100	1.9	3.7	3.0
07	240	3.4	200	3.0	100	2.3	5.5	3.0
08	280	3.8	200	3.4	100	2.4	4.7	2.9
09	340	4.0	200	3.6	100	2.8	5.0	2.8
10	360	4.1	220	3.7	100	3.0	4.4	2.9
11	390	4.0	220	3.7	100	3.1	4.3	2.8
12	420	4.2	220	3.7	100	3.0	3.9	2.8
13	390	4.4	200	3.8	100	3.0	3.4	2.8
14	400	4.4	200	3.7	100	2.8		2.8
15	380	4.3	200	3.7	100	2.9	4.6	2.8
16	350	4.4	220	3.7	100	2.7	6.6	2.9
17	320	4.3	210	3.5	100	2.6	4.0	3.0
18	300	4.1	220	3.1	100	2.5	4.0	2.9
19	280	3.9	210	2.8	100	1.8	3.8	3.0
20	230	3.5	---	---	100	1.8	4.8	3.0
21	220	3.4			---	E	3.8	3.0
22	230	3.3			---	E	4.9	3.0
23	230	3.1			---	E	4.0	3.0

Time: 90.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 29

Fort Chimo, Canada (68.1°N, 68.3°W) April 1963

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	320	2.9			120	2.2	4.0	3.9
01	320	3.0			110	2.5	4.9	2.8
02	340	2.9			110	2.8	3.5	(2.9)
03	---	<2.9			110	3.3		---
04	(380)	(3.4)	---	---	110	3.2		(2.9)
05	(350)	<3.8	---	---	110	3.6		(2.9)
06	(320)	<3.9	---	---	100	3.8		(2.9)
07	380	<3.9	270	3.8	110	3.2		2.9
08	460	4.0	280	3.8	110	3.0		2.7
09	440	4.2	250	3.9	110	3.0		2.8
10	450	4.4	230	4.0	110	3.0		2.8
11	450	4.4	230	4.0	110	3.0		2.8
12	430	4.4	230	4.0	110	3.0		2.6
13	410	4.6	230	3.9	110	3.0		2.8
14	440	4.6	250	3.9	110	3.0		2.8
15	420	4.6	280	3.8	110	2.9		2.8
16	400	4.4	280	3.6	110	2.9		2.8
17	330	4.2	280	3.3	110	2.9		2.8
18	300	4.1	---	---	110	2.9		2.9
19	300	3.9			110	2.3	6.2	2.9
20	300	3.6			110	2.2	6.0	2.9
21	300	3.5			---	---	6.0	2.9
22	300	3.3			110	2.6	6.0	2.9
23	300	3.0			110	3.8	5.2	3.0

Time: 75.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 30

Lindau/Harz, Germany (61.6°N, 10.1°E) April 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	3.1						3.0
01	280	3.0					1.9	3.0
02	270	2.9					2.0	3.0
03	275	2.7					2.0	3.0
04	270	2.6			---	---	2.0	3.0
05	260	2.6			---	E	2.2	3.2
06	250	3.3	225	---	---	E	2.6	3.4
07	280	4.0	220	3.2	115	2.0	2.6	3.4
08	320	4.4	220	3.6	110	2.4	2.8	3.2
09	320	4.8	215	3.8	105	2.6	3.2	3.2
10	320	5.0	210	4.0	105	2.9	3.0	3.2
11	340	5.2	210	4.2	105	2.9	3.3	3.2
12	310	5.4	210	4.2	105	3.0	3.6	3.2
13	330	5.4	220	4.2	105	3.0	3.9	3.2
14	310	5.5	210	4.1	105	3.0	3.5	3.2
15	305	5.4	215	4.0	105	2.8	3.8	3.3
16	300	5.4	215	3.8	105	2.6	3.2	3.3
17	280	5.3	225	3.6	110	2.3	3.0	3.3
18	260	5.4	230	---	120	1.8	2.6	3.3
19	250	5.3	240	---	---	E	2.4	3.3
20	240	5.4			---	---	2.2	3.2
21	240	4.8						3.2
22	250	3.8						3.2
23	270	3.4					1.9	3.0

Time: 15.0°E.
Sweep: 1.0 Mc to 16.0 Mc in 8 minutes.

Table 31

St. John's, Newfoundland (47.6°N, 52.7°W) April 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	2.4						2.8
01	310	2.1						2.9
02	310	1.8						2.9
03	300	1.9						(2.9)
04	320	1.6						3.0
05	250	2.7	---	---	120	1.8	1.4	3.2
06	240	3.4	240	3.2	120	2.1		3.3
07	G	>3.9	220	3.6	110	2.4		3.0
08	420	4.1	210	3.8	110	2.8		2.9
09	500	4.3	210	4.0	110	2.9		2.6
10	410	4.5	200	4.0	110	3.0		2.9
11	400	4.6	200	4.1	110	3.1		2.9
12	370	5.0	210	4.2	110	3.1		3.0
13	350	5.0	210	4.1	110	3.0	2.0	3.2
14	340	5.0	210	4.0	110	3.0		3.2
15	350	5.0	220	3.9	110	2.8		3.1
16	310	5.1	220	3.6	110	2.5		3.2
17	290	5.1	240	3.1	120	2.1		3.2
18	260	5.2	250	---	140	1.8	1.5	3.2
19	250	5.2						3.2
20	250	4.3						3.1
21	250	3.7						3.0
22	270	3.0						3.0
23	310	2.5						2.9

Time: 60.0°W.
Sweep: 0.8 Mc to 10.0 Mc in 18 seconds.

Table 32

Wakkanai, Japan (45.4°N, 141.7°E) April 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	310	(3.8)						(2.8)
01	320	3.7						2.8
02	300	(4.0)						(2.8)
03	300	3.6						2.9
04	290	3.6						3.0
05	300	4.2						3.1
06	280	4.6	270	3.2	120	2.0		3.2
07	290	5.4	250	3.6	120	2.4		3.1
08	320	5.9	240	3.8	120	2.6		3.0
09	320	6.0	250	3.9	110	3.0		3.0
10	310	6.2	240	4.2	110	3.0		3.0
11	350	6.1	220	4.2	120	3.0		3.0
12	330	6.1	250	4.2	120	3.0	3.0	3.0
13	330	6.2	230	4.2	120	3.0		3.0
14	320	6.3	260	4.0	120	3.0		3.0
15	300	6.2	260	3.9	120	2.8		3.0
16	300	6.0	260	3.6	120	2.5		3.0
17	300	5.7	260	3.3	120	2.1		3.1
18	280	5.7						3.0
19	270	5.7					3.0	3.0
20	300	4.3						3.0
21	290	4.4						2.9
22	300	4.2						2.8
23	300	(4.6)						(2.9)

Time: 135.0°E.
Sweep: 1.0 Mc to 15.5 Mc in 2 mimutes.

Table 33

Akita, Japan (39.7°N, 140.1°E) April 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	4.0					2.4	2.8
01	300	4.0					2.0	2.8
02	280	3.9					2.0	2.8
03	250	3.7					2.2	3.1
04	250	3.5					2.2	3.0
05	260	3.6	---	---	---	---	2.1	3.1
06	250	4.8	---	---	130	1.9		3.4
07	250	5.5	250	3.6	110	2.5	2.8	3.3
08	280	5.9	240	4.0	110	2.8		3.3
09	300	6.4	240	4.3	110	3.0	3.5	3.2
10	300	6.5	240	4.4	110	3.1	4.5	3.1
11	310	6.9	240	4.5	110	3.2	4.2	3.0
12	320	6.8	230	4.5	110	3.2	4.1	3.0
13	310	7.2	220	4.4	110	3.2	3.8	3.0
14	300	7.4	240	4.3	110	3.0		3.1
15	290	7.0	240	4.1	110	3.0	3.2	3.2
16	230	6.8	240	3.7	110	2.6	3.5	3.2
17	260	6.3	250	3.4	120	2.2	3.3	3.2
18	250	6.1	---	---	---	---	3.1	3.2
19	250	5.9					3.0	3.2
20	250	5.3					3.0	3.1
21	270	4.6					2.8	2.9
22	300	4.4					2.8	2.8
23	300	4.2					2.2	2.8

Time: 135.0°E.
Sweep: 0.85 Mc to 22.0 Mc in 2 mimutes.

Table 34

Tokye, Japan (35.7°N, 139.5°E) April 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	4.0					2.3	2.7
01	300	4.0					2.2	2.8
02	280	4.1					2.2	2.9
03	250	3.9					2.2	3.0
04	260	3.2					2.3	2.9
05	260	3.5					2.2	3.0
06	240	5.0	---	---	140	2.0	2.8	3.4
07	250	5.6	240	3.8	120	2.5	4.2	3.4
08	270	6.2	240	4.1	110	2.8	4.4	3.2
09	300	6.6	230	4.4	110	3.0	4.5	3.2
10	310	6.7	220	4.4	110	3.2	4.8	3.0
11	300	7.8	230	4.5	110	3.2	5.0	3.0
12	320	7.9	230	4.6	110	3.2	5.0	3.0
13	300	8.1	240	4.5	110	3.2	4.9	3.0
14	300	8.0	240	4.4	110	3.2	4.7	3.0
15	280	8.0	240	4.2	110	3.0	4.3	3.1
16	270	7.8	240	3.9	120	2.7	3.7	3.2
17	260	7.2	250	3.5	120	2.2	4.0	3.2
18	250	6.7	---	---	---	---	*3.5	3.2
19	240	6.4					3.2	3.2
20	240	6.2					3.0	3.1
21	270	4.3					2.6	2.8
22	300	4.4					3.0	2.7
23	300	4.0					2.6	2.7

Time: 135.0°E.
Sweep: 1.0 Mc to 17.2 Mc in 2 mimutes.

Table 35

Yamagawa, Japan (31.2°N, 130.6°E) April 1953*

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	260	3.9					3.2	3.2
01	250	4.0					3.0	3.2
02	240	4.1					3.0	3.3
03	220	3.6					2.6	3.6
04	230	3.3					2.5	3.5
05	250	2.9					2.6	3.3
06	220	4.8			---	---	3.2	3.5
07	210	5.7	---	---	110	2.3	3.7	3.8
08	220	6.1	---	---	100	2.7	4.4	3.7
09	230	6.4	---	---	100	3.0	5.8	3.8
10	250	6.9	---	---	100	3.2	6.5	3.4
11	270	7.0	200	4.9	---	---	5.2	3.2
12	260	8.7	210	4.8	---	3.2	5.7	3.3
13	270	8.7	200	4.5	100	3.3	6.2	3.3
14	260	9.1	200	4.5	100	3.4	5.8	3.3
15	250	9.5	220	4.4	100	3.2	5.8	3.4
16	240	9.8	200	4.1	100	3.0	4.8	3.6
17	230	9.1	220	---	100	2.7	4.4	3.6
18	220	8.1	---	---	100	2.1	5.1	3.6
19	210	7.0					4.2	3.6
20	210	6.0					4.2	3.6
21	(240)	(4.9)					4.2	(3.3)
22	(260)	(4.2)					4.5	(3.0)
23	260	4.0					3.2	3.1

Time: 135.0°E.
Sweep: 1.0 Mc to 20.0 Mc in 15 minutes, manual operation.
*Observations taken April 17, 13th hour, through April 30, only.

Table 36

Watheroo, W. Australia (30.3°8, 115.9°E) April 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	250	3.6					2.8	3.0
01	260	3.6					3.8	3.0
02	250	3.8					3.4	3.1
03	240	3.7					3.2	3.2
04	240	3.6					3.2	3.2
05	250	3.2					2.6	3.1
06	240	2.8					2.0	3.1
07	230	4.5				1.7		3.5
08	240	5.7	220	3.2		2.4	2.7	3.4
09	260	6.3	220	4.0		2.7	3.0	3.3
10	260	6.6	220	4.2		3.0	3.4	3.2
11	260	6.8	200	4.4		3.2	3.6	3.2
12	280	7.0	220	4.4		3.3	3.7	3.2
13	270	7.4	200	4.5		3.3	3.8	3.3
14	270	7.6	210	4.4		3.2	3.6	3.2
15	260	7.4	220	4.2		3.0	3.6	3.2
16	250	6.7	220	3.8		2.6	3.2	3.3
17	230	6.0				2.2	3.0	3.5
18	220	5.2					2.7	3.4
19	220	3.9					2.6	3.4
20	240	3.3					2.0	3.1
21	250	3.4					2.4	3.0
22	260	3.4					2.0	2.9
23	260	3.5					2.7	3.0

Time: 120.0°E.
Sweep: 1.0 Mc to 16.0 Mc in 2 minutes.

Table 37

Wakkanai, Japan (45.4°N, 141.7°E) March 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	3.4						2.8
01	300	3.2						3.0
02	300	3.2						2.9
03	280	3.2						3.0
04	280	3.1						2.9
05	280	3.0						2.9
06	260	3.9			---	E		3.1
07	260	4.8	260	3.2	120	1.8		3.2
08	280	6.4	230	3.8	120	2.6		3.2
09	300	6.0	240	3.9	120	2.7		3.2
10	290	6.0	230	4.0	110	2.7		3.2
11	300	6.5	230	3.9	110	2.8		3.1
12	300	7.0	240	3.9	120	2.9		3.1
13	290	7.0	240	4.0	120	2.8		3.1
14	290	6.7	250	3.9	110	2.8		3.2
15	280	6.2	240	3.7	120	2.6		3.2
16	260	5.8	260	3.4	120	2.2		3.2
17	250	5.5	---	---	130	1.6		3.2
18	250	4.7						3.1
19	260	3.9						3.0
20	280	3.2						3.0
21	300	3.3						2.9
22	300	3.3						3.0
23	300	3.4						2.9

Time: 135.0°E.
Sweep: 1.0 Mc to 15.6 Mc in 2 minutes.

Table 38

Akita, Japan (39.7°N, 140.1°E) March 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	3.6					2.2	3.0
01	280	3.6					2.2	3.0
02	270	3.6					2.2	3.1
03	250	3.5					2.2	3.1
04	250	3.3					2.2	3.1
06	260	3.2					2.2	3.1
06	230	4.1			150	1.8	2.1	3.6
07	240	5.2	240	3.2	120	1.9		3.5
08	250	5.7	230	3.5	110	2.5	3.0	3.4
09	270	6.0	230	4.0	110	3.8	3.6	3.3
10	280	6.9	220	4.2	110	2.9	3.6	3.3
11	280	7.4	230	4.3	110	3.0	3.7	3.2
12	280	7.6	230	4.3	110	3.1	3.5	3.2
13	280	7.5	220	4.2	110	3.1	3.5	3.2
14	270	7.0	230	4.1	110	3.0	3.2	3.3
15	260	6.5	230	3.9	110	2.8	3.5	3.4
16	250	6.0	240	3.5	120	2.5	3.2	3.4
17	250	6.0	250	---	120	1.8	2.7	3.4
18	230	5.5					2.3	3.4
19	240	4.3					2.3	3.2
20	260	3.8					2.2	3.0
21	280	3.9					2.2	3.0
22	290	3.7						3.0
23	300	3.7					2.2	2.9

Time: 135.0°E.
Sweep: 0.85 Mc to 22.0 Mc in 6 minutes, automatic operation.

Table 39

Tokyo, Japan (35.7°N, 139.5°E) March 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	3.6					2.1	2.9
01	270	3.6					2.1	2.9
02	260	3.5					2.3	3.0
03	250	3.5					2.3	3.1
04	240	3.0					2.3	3.1
05	250	3.0					2.0	3.0
06	230	4.1			160	1.8	2.3	3.3
07	240	5.3	240	---	120	2.0	2.6	3.5
08	250	5.9	230	3.7	110	2.5		3.4
09	270	6.3	220	4.1	110	2.8		3.3
10	280	6.9	220	4.3	110	3.0		3.2
11	280	7.4	220	4.4	110	3.1		3.1
12	280	8.4	230	4.4	110	3.2	4.0	3.2
13	280	8.2	230	4.3	110	3.1		3.2
14	270	7.4	230	4.2	110	3.0		3.2
15	270	6.8	230	4.0	110	2.8		3.3
16	250	6.5	240	3.6	120	2.5	3.1	3.3
17	240	6.4	240	2.6	130	1.9	2.6	3.3
18	230	6.0					2.6	3.4
19	230	4.5					2.6	3.2
20	260	3.8					2.4	3.0
21	280	3.7					2.2	2.9
22	300	3.6					2.0	2.8
23	300	3.6					2.2	2.8

Time: 135.0°E.
Sweep: 1.0 Mc to 17.2 Mc in 2 minutes.

Table 40

Yamagawa, Japan (31.2°N, 130.6°E) March 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	3.2						
01	270	3.3						
02	270	3.3						
03	260	3.4						
04	220	3.4						
05	250	2.7						
06	260	2.8						
07	220	4.4						
08	240	6.4						
09	260	6.2						
10	280	6.6						
11	290	7.0						
12	300	7.5						
13	280	8.8						
14	280	8.8						
15	270	9.0						
16	260	7.2						
17	250	7.0						
18	230	6.6						
19	220	5.0						
20	240	4.0						
21	260	3.4						
22	270	3.3						
23	290	3.2						

Time: 135.0°E.
Sweep: 1.0 Mc to 22.0 Mc in 2 minutes.

Table 41

Rarotonga I. (21.3°S, 159.8°W) February 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	5.9					3.0	2.9
01	260	5.7					3.1	3.0
02	250	4.7					2.9	3.1
03	280	3.8						2.9
04	300	3.9					2.6	2.8
05	<300	3.8						2.9
06	<270	3.8					2.6	3.0
07	250	6.1	---	---	110	2.1	3.4	3.2
08	280	7.4	240	4.2	110	2.7	4.0	3.2
09	300	7.7	220	4.4	110	3.0	4.2	3.1
10	300	8.8	210	4.5	110	3.2	4.4	3.1
11	320	8.8	210	4.6	110	3.4	4.5	3.0
12	300	9.2	200	4.6	110	3.4	4.6	3.0
13	300	9.4	200	4.6	110	3.4	4.6	3.1
14	290	9.4	200	4.6	110	3.3	4.5	3.1
15	300	8.4	200	4.6	110	3.2	4.4	3.1
16	300	7.9	200	4.5	110	3.1	4.5	3.1
17	300	7.7	200	4.5	110	2.9	4.4	3.0
18	280	7.5	---	---	---	---	3.8	3.0
19	260	7.5					3.9	3.1
20	260	6.6					3.6	3.1
21	260	6.4					2.9	2.9
22	290	6.0					2.9	2.9
23	290	5.7					2.9	2.8

Time: 157.5°W.
Sweep: 2.0 Mc to 16.0 Mc, manual operation.

Table 42

Buenos Aires, Argentina (34.6°S, 58.5°W) February 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	5.4						2.9
01	290	6.2						2.9
02	280	5.5						3.1
03	260	5.0						3.3
04	260	4.3					3.1	3.2
05	280	3.8						3.1
06	240	4.8					2.5	3.4
07	260	5.6	230	---	110	2.6	3.6	3.4
08	290	5.7	220	---	110	2.9	4.0	3.2
09	310	6.5	210	4.4	110	3.2	4.0	3.1
10	310	7.0	210	4.5	100	3.3	4.2	2.9
11	320	7.8	210	4.5	100	3.3	4.0	2.9
12	310	8.7	210	4.5	100	3.4	4.0	3.0
13	300	9.4	210	4.6	100	3.4	4.0	3.0
14	300	9.5	210	4.5	100	3.3	3.8	3.1
15	290	9.3	210	4.4	110	3.2	4.0	3.1
16	280	8.9	220	4.2	120	3.1	3.8	3.2
17	270	9.0	230	---	110	2.9	3.9	3.3
18	250	8.2	250	---			3.6	3.4
19	240	7.2						3.4
20	260	6.6					3.3	3.2
21	280	5.8						3.0
22	300	5.7						2.9
23	300	5.8						2.9

Time: 60.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 30 seconds.

Table 43

Christchurch, New Zealand (43.6°S, 172.7°E) February 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	4.4					3.5	3.0
01	270	4.0					2.2	3.0
02	260	3.7					2.5	3.0
03	260	3.2					2.7	3.1
04	270	2.6				—	3.3	3.1
05	270	2.8				1.1	3.0	3.2
06	250	3.9	240	(3.3)		1.8		3.4
07	270	4.7	230	3.6		2.3		3.3
08	300	5.0	230	4.0		2.7		3.3
09	320	5.4	220	4.2		2.8	4.1	3.2
10	310	5.6	220	4.3		3.0	4.4	3.2
11	320	5.8	200	4.3		3.2	4.5	3.2
12	320	6.1	210	4.4		3.3	4.2	3.2
13	300	5.9	220	4.4		3.3	3.8	3.2
14	320	5.9	230	4.3		3.2		3.2
15	320	5.8	220	4.2		3.1	4.0	3.2
16	310	5.6	220	4.1		2.8		3.2
17	280	5.5	230	3.8		2.5	3.8	3.1
18	270	5.4	240	3.3		2.0		3.1
19	250	5.7				1.3		3.1
20	250	6.0					3.0	3.0
21	260	5.8					3.4	3.0
22	260	5.2					3.5	3.1
23	270	4.7					4.0	2.9

Time: 172.5°E.
Sweep: 1.0 Mc to 13.0 Mc in 1 minute 55 seconds.

Table 44

Decepcion I. (63.0°S, 60.7°W) February 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	6.3						3.0
01	280	6.2						3.0
02	270	5.8						3.1
03	280	5.5						3.0
04	280	5.4						3.0
05	250	5.5						3.2
06	260	5.0					2.5	(3.3)
07	260	5.0					3.0	(3.2)
08	260	4.8					4.0	3.4
09								
10	(270)	5.3					5.5	(3.3)
11	(280)	5.8					4.8	3.3
12								
13	260	5.7					4.5	(3.3)
14	300	5.3					4.5	(3.4)
15	280	5.5					4.0	(3.4)
16	280	5.4					4.2	(3.4)
17								
18	260	5.5					3.5	(3.3)
19	270	5.8					4.5	3.4
20	260	6.0						3.2
21	260	6.0						(3.2)
22	280	6.0						3.1
23	280	6.3						3.0

Time: 60.0°W.
Sweep: 1.5 Mc to 16.0 Mc in 15 minutes, manual operation.

Table 45*

Inverness, Scotland (57.4°N, 4.2°W) January 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	320	(1.8)						(2.8)
01	305	(1.8)					2.1	
02	310	(1.5)					2.3	(2.8)
03	315	1.5					1.4	(2.8)
04	305	1.4					2.4	(2.9)
05	285	(1.6)					2.3	(2.9)
06	285	1.8						(3.0)
07	(310)	<1.6					2.2	
08	265	2.3					2.1	(3.0)
09	225	4.3			(145)	(1.7)	2.5	3.5
10	225	5.2			(140)	1.9	2.4	3.5
11	235	5.9	(225)	(3.0)	(140)	2.1	2.3	3.5
12	235	6.3	(230)	(3.0)	140	2.2	2.3	3.5
13	235	6.2	(225)	(3.0)	(140)	2.2	2.4	3.5
14	235	5.9	(230)	(2.9)	(145)	2.1	2.2	3.5
15	225	5.6			(160)	1.9	2.0	3.5
16	220	4.9			(165)	(1.7)	2.4	3.5
17	225	4.2						3.3
18	255	2.8						3.3
19	305	2.1						(3.1)
20	(320)	(1.8)						(3.0)
21	325	(1.7)						(3.0)
22	345	(1.6)						
23	330	(1.6)						(2.8)

Time: 0.0°.
Sweep: 0.67 Mc to 25.0 Mc in 5 minutes.
*Average values except foF2 and fEs, which are median values.

Table 46*

Slough, England (51.5°N, 0.6°W) January 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	2.6					2.6	3.0
01	275	2.8					3.0	2.9
02	275	2.6					3.2	2.9
03	270	2.4					3.3	2.9
04	270	2.2					3.8	3.0
05	260	2.2					4.0	3.0
06	280	1.9					2.6	3.0
07	270	1.9					3.0	3.1
08	230	4.0			120#	1.7#	3.3	3.4
09	220	5.3	220#	3.5#	135	1.9	4.2	3.6
10	230	6.1	225	3.4	130	2.2	4.3	3.5
11	235	6.6	225	3.6	130	2.4	4.3	3.5
12	230	6.7	220	3.6	130	2.5	4.3	3.5
13	230	8.4	215	3.5	130	2.4	4.7	3.5
14	230	6.3	220	3.3	130	2.3	4.5	3.6
15	225	5.7	230#	3.1#	135	2.1	4.1	3.6
16	215	5.3			145	1.8	3.5	3.5
17	225	4.6					2.6	3.4
18	235	3.6					2.4	3.2
19	255	2.6					2.5	3.0
20	280	2.6					2.3	3.0
21	290	2.6					2.5	3.0
22	285	2.6					2.3	3.0
23	280	2.4					2.8	3.0

Time: 0.0°.
Sweep: 0.55 Mc to 16.5 Mc in 5 minutes.
*Average values except foF2 and fEs, which are median values.
#One or two observations only.

Table 47*

Khartoum, Sudan (15.6°N, 32.6°E) January 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	275	4.2						3.0
01	250	4.2						3.3
02	230	3.5				(0.9)#		3.3
03	220	2.1				(0.9)#	1.6	3.2
04	260	1.3				(1.0)#	1.8	3.4
05	270	1.2				(1.0)#	2.6	3.3
06	260	2.6				(1.8)	1.7	3.1
07	240	(6.2)	220		130	2.1	3.4	3.2
08	290	7.8	230	4.3	125	2.6	4.3	3.1
09	290	8.8	220	4.4	120	3.1	3.8	2.8
10	310	9.1	220	4.4	120	3.3		2.7
11	340	8.9	220	4.6	120	3.4		2.7
12	320	9.1	210	4.6	120	3.4		2.8
13	310	9.4	230	4.6	120	3.4	4.3	3.0
14	290	9.2	220	4.5	120	3.2	5.2	2.9
15	280	9.4	230	4.4	120	3.0	5.5	3.1
16	260	8.8	230	4.0	120	2.6	5.6	3.3
17	250	8.2				1.9	5.4	3.3
18	240	8.0					3.1	3.3
19	250	7.0					3.1	3.2
20	250	6.3					2.6	3.2
21	250	6.0						2.9
22	250	5.7					2.6	3.1
23	280	4.7					1.6	2.9

Time: 30.0°E.
Sweep: 0.67 Mc to 25.0 Mc in 5 minutes.
*Average values except foF2 and fEs, which are median values.
#One or two observations only.

Table 48*

Singapore, British Malaya (1.3°N, 103.8°E) January 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	245	3.6					2.8	3.1
01	265	3.3					1.6	2.9
02	280	2.9					2.6	2.9
03	280	2.4					1.9	3.0
04	275	2.2					1.9	3.0
05	270	1.9					3.4	3.1
06	290	2.6					3.4	3.1
07	245	5.4			(125)	2.0	3.5	3.1
08	330	6.3	225		(120)	2.7	4.7	2.8
09	385	7.1	215	4.4	115	3.1	6.4	2.3
10	420	7.6	205	4.5	110	3.3	5.6	2.1
11	440	8.0	200	4.6	110	3.4	6.0	2.0
12	425	7.8	205	4.6	110	3.5	5.8	2.1
13	415	8.0	200	4.6	110	3.5	5.9	2.2
14	385	8.4	200	4.6	110	3.4	5.0	2.2
15	375	8.4	210	4.5	110	3.2	5.4	2.3
16	360	8.4	225	4.3	115	2.9	4.1	2.4
17	305	8.4	245		120	2.4	3.6	2.5
18	265	8.0			(125)	(1.7)	2.9	2.5
19	290	7.8					3.0	2.6
20	290	8.8					2.8	2.7
21	270	6.4					2.8	2.9
22	240	6.0					2.9	3.2
23	235	4.3					3.0	3.2

Time: 105.0°E.
Sweep: 0.67 Mc to 25.0 Mc in 5 minutes.
*Average values except foF2 and fEs, which are median values.

Table 49

Rarotonga I. (21.3°S, 159.8°W) January 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	6.4					3.8	3.0
01	250	5.9					3.8	3.0
02	<290	5.0					3.5	2.9
03	280	4.5					3.0	2.9
04	300	4.4					3.0	2.9
05	290	4.4					3.0	2.9
06	260	4.2			---	---	3.2	3.0
07	250	6.0	250	3.9	110	2.5	4.2	3.0
08	320	6.9	220	4.3	110	3.0	4.4	3.0
09	330	8.0	220	4.5	110	3.2	4.6	3.0
10	340	9.1	220	4.7	110	3.3	4.8	2.9
11	350	10.5	220	4.8	110	3.4	4.8	2.8
12	310	11.4	200	4.7	110	3.5	5.0	3.0
13	300	12.0	210	4.6	110	3.5	4.5	3.0
14	300	10.3	210	4.6	110	3.4	4.7	3.1
15	300	8.7	220	4.5	110	3.3	4.4	3.0
16	300	7.6	220	4.3	110	3.1	4.2	3.1
17	300	7.0	250	4.3	110	2.9	4.5	3.1
18	260	6.9	230	3.5	120	2.3	4.0	3.0
19	290	6.3					4.4	2.8
20	310	5.8					4.2	2.8
21	310	6.7					3.8	2.8
22	300	6.5					3.7	2.8
23	300	6.5					3.5	2.9

Time: 157.5°W.
Sweep: 2.0 Mc to 16.0 Mc, manual operation.

Table 50

Buenos Aires, Argentina (34.5°S, 58.3°W) January 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	5.5					3.2	2.9
01	290	5.2					3.4	3.0
02	280	5.0					4.0	3.1
03	280	4.4					2.5	3.0
04	280	4.0						3.0
05	280	4.2					2.2	3.1
06	280	5.0	240	---	130	2.1	3.7	3.3
07	300	5.4	230	4.2	110	2.8	4.1	2.9
08	350	5.8	220	4.3	110	3.0	4.3	2.7
09	400	6.7	200	4.4	110	3.2	4.4	2.6
10	400	8.1	200	4.5	100	3.3	4.8	2.7
11	370	8.4	200	4.5	100	3.3	4.6	2.8
12	350	9.2	200	4.6	100	3.4	4.6	2.9
13	320	9.4	200	(4.5)	110	3.4	4.6	2.9
14	300	9.7	200	4.6	100	3.3	4.2	3.0
15	290	9.9	200	4.3	100	3.2	4.0	3.2
16	280	8.8	210	4.2	110	3.1	4.1	3.2
17	280	6.9	220	---	110	3.0	4.1	3.3
18	270	6.5	230	---	---	---	3.5	3.1
19	260	6.4						3.0
20	290	6.0						2.9
21	310	5.6					3.1	2.9
22	300	5.7					3.5	2.8
23	300	5.9					3.9	2.9

Time: 60.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 30 seconds.

Table 51

Christchurch, New Zealand* (43.6°S, 172.7°E) January 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	4.8					2.8	2.9
01	260	4.4					2.6	3.0
02	260	3.7					3.2	3.0
03	270	2.8					3.3	3.0
04	280	2.6				---	2.8	3.0
05	270	3.8	280	---		1.6		3.2
06	330	4.4	240	3.6		2.2	3.8	3.1
07	330	5.1	240	3.9		2.6	4.8	3.0
08	330	5.3	220	4.1		2.8	5.4	3.0
09	330	5.6	220	4.3		3.1	4.4	3.0
10	330	5.8	220	4.4		3.2	4.3	3.0
11	340	6.0	210	4.5		3.3	5.7	3.1
12	350	5.9	200	4.4		3.3	4.2	2.9
13	350	5.8	220	4.4		3.3	4.3	3.0
14	360	5.7	220	4.4		3.3	4.2	3.0
15	340	5.7	220	4.3		3.2	5.9	3.0
16	330	5.7	220	4.2		2.9	5.2	3.0
17	320	5.7	220	3.9		2.7	4.3	3.0
18	300	5.5	240	3.4		2.3	4.0	3.0
19	270	5.7	270	2.7		1.8		3.0
20	260	6.2				1.4	4.0	2.9
21	270	6.5					4.0	2.9
22	270	6.0					3.2	2.9
23	270	5.5					3.3	2.9

Time: 172.5°E.
Sweep: 1.0 Mc to 13.0 Mc in 1 minute 55 seconds.
*From 1000, January 11, to 2300, January 31, observations were taken at Godley Head (43.6°S, 172.8°E).

Table 52

Decepcion I. (63.0°S, 60.7°W) January 1953

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	6.8	---	---				3.1
01	270	6.5	---	---				3.0
02	280	6.4	---	---				3.0
03	280	6.2	---	---				3.0
04	280	6.0	---	---				3.0
05	280	5.8	---	---			3.0	(3.1)
06	280	5.2	---	---			3.2	(3.2)
07	300	5.2	---	---			4.0	(3.3)
08	320	5.7	---	---			4.3	(3.2)
09								
10	(330)	6.0	---	---			5.8	(3.1)
11	(310)	5.6	---	---			5.5	(3.1)
12								
13	(280)	5.2	---	---			4.5	(3.3)
14	(300)	5.4	---	---			4.5	(3.2)
15	(280)	5.2	---	---			4.5	(3.2)
16	(290)	5.4	---	---			4.0	(3.1)
17								
18	300	5.2	---	---			4.5	(3.2)
19	280	5.4	---	---			3.0	(3.3)
20	280	5.9	---	---			3.0	3.2
21	280	6.0						3.2
22	280	6.2						3.1
23	280	7.0						3.0

Time: 60.0°W.
Sweep: 1.5 Mc to 16.0 Mc in 15 minutes, manual operation.

Table 53*

Falkland Is. (51.7°S, 57.8°W) December 1952

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	6.6					2.9	2.7
01	290	6.3					3.1	2.7
02	280	6.2					2.6	2.8
03	300	6.1						2.7
04	280	6.1	260		145	1.8		2.7
05	305	6.5	250	(3.5)	130	2.1	2.6	2.7
06	310	6.2	250	3.8	120	2.5	3.1	2.7
07	370	6.1	240	4.1	110	2.8	5.0	2.7
08	350	6.4	250	4.3	110	3.0	5.3	2.8
09	360	6.2	230	4.3	105	3.1	5.9	2.7
10	370	6.3	230	4.5	105	3.2	5.5	2.8
11	370	6.9	230	4.5	105	3.3	4.8	2.8
12	365	6.6	235	4.5	105	3.4	5.9	2.8
13	350	6.7	235	4.5	105	3.4	5.6	2.8
14	335	6.6	240	4.5	105	3.3	4.8	2.9
15	340	6.2	230	4.3	105	3.1	4.8	2.9
16	315	6.2	250	4.2	115	2.9	5.0	3.0
17	300	6.1	240	4.0	115	2.7	4.6	3.0
18	305	5.9	240	3.7	120	2.3	3.9	2.9
19	270	6.0	250		130	1.9	4.2	2.9
20	280	6.2					3.8	2.8
21	295	6.6					3.1	2.8
22	300	6.7					3.0	2.6
23	300	6.8					2.5	2.5

Time: 60.0°W.
Sweep: 0.67 Mc to 25.0 Mc in 5 minutes.
*Average values except foF2 and fEs, which are median values.

Table 54*

Port Lockroy (64.8°S, 63.5°W) December 1952

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	8.2						
01	275	8.2						
02	275	8.1						
03	285	8.1						
04	295	(7.3)	(230)	(3.0)				
05	(295)	7.5	(225)	(3.6)				
06	(305)	6.8	(220)	(3.7)	(110)	(2.4)		
07	(300)	6.2		(3.8)	(100)	(2.7)		
08	325	5.7		(4.1)	(105)	(2.8)	4.6	
09	315	5.9		(4.2)	(105)	(3.0)	3.6	
10		(5.9)						
11	330	5.2		(4.3)	(105)	(3.1)	4.7	
12	350	5.4		(4.2)	(105)	(3.1)	5.3	
13		(5.6)						
14		(5.3)					(5.7)	
15	(340)	(5.3)						
16	(310)	5.3					3.6	
17	(325)	(5.4)					(4.4)	
18	(295)	5.8	(215)	(3.7)				
19	(285)	(6.0)	(230)	(3.6)			3.9	
20	280	6.1	(235)	(3.3)				
21	(265)	6.0	(245)					
22	(275)	(6.8)						
23	270	7.0						

Time: 60.0°W.
Sweep: 1.1 Mc to 16.0 Mc, manual operation.
*Average values except foF2 and fEs, which are median values.

Table 55*

Ibadan, Nigeria (7.4°N, 4.0°E) November 1952

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	245	(7.6)						
01	250	(7.2)						
02	250	---						
03	240	5.2						
04	225	4.4						
05	225	3.1						
06	250	5.3			120	1.8	2.4	
07	240	7.5	(235)		110	2.7		
08	(250)	8.4	220		110	3.0	5.2	
09	(320)	7.9	205	(4.5)	110	3.4	5.1	
10	330	7.8	205	4.5	110	3.4	5.2	
11	335	7.8	205	4.6	110	3.5	5.2	
12	340	8.0	200	4.6	105	3.5	5.5	
13	335	8.1	200	(4.6)	105	3.4	5.6	
14	(320)	8.3	210	(4.5)	105	3.3	5.4	
15	(300)	8.5	215		110	3.0	5.0	
16	(220)	8.7	(230)		110	(2.6)	4.9	
17	260	8.6			115	1.8		
18	295	8.3					2.2	
19	310	>8.0						
20	280	8.6						
21	250	8.9						
22	235	7.7						
23	245	(7.5)						

Time: 0.0°.
Sweep: 0.67 Mc to 25.0 Mc in 5 minutes.
*Average values except foF2 and fEs, which are median values.

Table 56

Tananarive, Madagascar (18.8°S, 47.8°E) October 1952

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	260	5.2						3.1
01	230	4.8						3.3
02	240	3.6						3.0
03	255	3.0						3.0
04	260	2.8						3.0
05	270	2.8						3.0
06	240	4.9	---	---	140	1.9	1.9	3.4
07	260	6.2	238	---	119	2.4	2.4	3.3
08	285	7.0	225	4.4	115	2.9	3.0	3.2
09	290	7.4	220	4.6	113	3.2	3.2	3.1
10	310	7.6	220	4.7	117	3.4	3.2	3.0
11	310	8.0	215	4.7	117	3.4	3.2	3.0
12	305	9.0	210	4.7	119	3.5	3.2	3.0
13	300	9.0	220	4.7	115	3.4	3.1	3.0
14	300	8.6	230	4.6	115	3.3	3.2	3.0
15	300	8.6	230	4.5	113	3.1	3.1	3.0
16	280	8.5	235	4.2	120	2.8	3.1	3.1
17	260	8.6	240	---	123	2.3	3.1	3.1
18	240	8.4	---	---	---	---	2.5	3.2
19	235	7.6					2.4	3.1
20	240	7.0					2.2	3.1
21	245	5.8						3.1
22	255	5.2						3.0
23	270	5.2						2.9

Time: Local.
Sweep: 1.25 Mc to 20.0 Mc in 10 minutes, automatic operation.

Table 57

Lulea, Sweden (65.6°N, 22.1°E) September 1952

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	345	(2.8)					2.6	
01								
02	340	(2.4)					1.9	
03								
04	(310)	2.3						
05								
06	295	3.8	245		---	E		
07								
08	315	4.5	230	3.8	120	2.5		
09								
10	300	5.2	215	3.9	120	2.7		
11								
12	300	5.5	210	4.0	110	2.7		
13								
14	290	5.5	230	---	115	2.6		
15								
16	265	4.9	245	---	125	2.2		
17								
18	260	4.1			---	E		
19								
20	285	(3.0)			---	E	2.6	
21								
22	330	(2.5)						
23								

Time: 15.0°E.
Sweep: 1.5 Mc to 10.0 Mc in 6 minutes, automatic operation.

Table 58*

Ibadan, Nigeria (7.4°N, 4.0°E) September 1952

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	---						
01	(260)	(6.8)					2.0	
02	(255)	>5.6					1.7	
03	(250)	(4.0)					1.8	
04	(240)	(2.8)						
05	(235)	(3.3)					1.8	
06	(235)	(6.4)			(121)	(2.0)	(2.3)	
07	(240)♯	(7.8)	(225)		(115)	(2.8)	4.2	
08		(9.2)	(215)		(110)♯	(3.1)	(5.6)	
09		9.2	210		(110)♯	(3.4)♯	10.2	
10	(340)	8.4	(200)	(4.8)	(107)♯	(3.5)♯	11.0	
11	(345)	8.1	200	(4.8)	(107)♯		11.0	
12	(340)	8.6	200	(4.8)	(100)	(3.6)♯	12.0	
13	(330)	8.8	200	(4.8)♯	(106)	(3.6)♯	10.6	
14	(315)♯	9.1	(200)	(4.6)♯	(107)	(3.4)♯	11.3	
15	(300)♯	9.6	(200)	(4.2)♯	(110)	(3.1)	7.2	
16	(260)♯	(9.7)	(205)		(110)	(2.6)	5.3	
17	(260)	9.8	(250)♯		122	(1.9)	3.6	
18	280	10.0					2.2	
19	305	9.2						
20	300	---						
21	265	---						
22	255	---						
23	265	---						

Time: 0.0°.
Sweep: 0.67 Mc to 25.0 Mc in 5 minutes.
*Average values except foF2 and fEs, which are median values.
♯Indicates less than 5 values.

Table 59

Lulea, Sweden (65.6°N, 22.1°E) August 1952

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	---					2.7	
01								
02	305	(2.7)					2.7	
03								
04	285	3.3	---	---	115	1.8		
05								
06	325	4.1	230	3.5	120	2.4		
07								
08	375	4.9	220	3.9	110	2.7	2.8	
09								
10	350	5.2	220	4.2	110	2.9	2.9	
11								
12	340	5.2	215	4.2	110	3.0		
13								
14	360	5.0	215	4.1	110	2.9		
15								
16	330	5.0	230	3.9	115	2.7		
17								
18	290	4.9	245	---	130	2.1	2.6	
19								
20	260	4.8	260	---				
21								
22	290	---						
23								

Time: 15.0°E.
Sweep: 1.5 Mc to 10.0 Mc in 6 minutes, automatic operation.

Table 60*

Ibadan, Nigeria (7.4°N, 4.0°E) August 1952

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	285	>5.0						
01	270	(4.8)						
02	260	(4.2)						
03	255	(3.8)						
04	(245)	(3.2)						
05	250	(1.8)						
06	250	5.1			135	1.9		
07	260	7.1	235		115	2.7		
08	310	8.2	215		110	3.1	4.8	
09	335	8.7	210	4.5	105	3.5	5.0	
10	365	8.3	205	4.6	105	3.7	5.0	
11	380	7.8	200	4.7	110	3.8	5.0	
12	375	7.6	200	4.7	105	3.8	5.4	
13	370	7.9	200	4.6	105	3.6	5.2	
14	365	8.2	200	4.5	110	3.5	5.2	
15	345	8.2	200	4.3	110	3.2	4.6	
16	265	8.5	200		110	2.7		
17	260	9.0	235		115	2.3		
18	270	9.2			130	1.6		
19	295	---						
20	300	---						
21	295	---						
22	285	---						
23	290	---						

Time: 0.0°.
Sweep: 0.67 Mc to 25.0 Mc in 5 minutes.
*Average values except foF2 and fEs, which are median values.

TABLE 61

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form accepted June 1946

IONOSPHERIC DATA

h'F2 (Characteristic), Km (Unit), JULY (Month), 1953

National Bureau of Standards (Institution)

Observed at Washington, D.C.

Scaled by: McC., E.J.W.

Lat. 38.7°N, Long. 77.1°W 75°W Mean Time

Calculated by: McC., E.J.W.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	(270)S	(270)S	(280)S	(290)S	(240)S	240	G	G	G	G	490	G	G	G	G	G	410	(480)S	350	250	250	(250)S	(260)S	250
2	(260)S	(260)S	(280)S	S	S	(260)S	(310)L	G	G	G	490	G	G	G	A	480	340	340	310	250	230	250	250	(240)S
3	270	250	(290)S	(280)S	[280]S	(290)S	G	380	A	A	420	G	G	G	G	470	420	[360]A	300	250	(250)A	250	260	(290)S
4	270	A	S	(270)S	A	A	(240)A	A	A	360	G	G	G	580	G	450	340	320	330	280	230	220	270	260
5	270	(270)S	(300)S	(300)S	[290]S	280	G	G	G	G	G	G	G	G	G	G	A	(450)S	290	250	260	250	230	240
6	(270)S	230	270	260	[250]S	240	G	G	G	G	G	G	480	370	330	420	330H	330	300	270	230	240	240	260
7	(270)S	260S	260	240	(280)S	(260)L	(410)L	440	G	A	450	G	A	A	A	A	A	A	320	270	250	240	220	250
8	(280)S	(290)S	(290)S	[300]S	(320)S	250	300	G	370	350	360	A	A	G	G	360	A	A	280	[260]A	(240)A	A	A	A
9	A	(290)S	S	A	S	240	250	400	G	G	360	380	G	G	A	500	330	340	300	240	220	220	250	[260]A
10	270	290	280	[280]S	270	260	300	420	370	480	320	A	G	400	490	420	350	350	340	270	(250)A	(240)A	250	A
11	A	A	(280)S	A	A	(250)A	A	A	A	340	300	400	350	320	[330]A	340	[360]A	370	340	(270)A	(230)A	230	250	270
12	(270)S	(260)S	250	(280)S	250	(230)A	G	G	440	A	A	A	(430)A	420	[430]A	440	M	320	280	230	240	240	240	250
13	240	[290]A	(340)S	(320)S	(290)S	(240)S	G	GA	G	G	G	G	G	GA	G	G	450	370H	320H	270	270	250	260	270
14	(270)A	270	230	250	(290)S	250	230	350	330	370	370	350	360	370	470	370	340	320	320	250	(250)A	260	230	270
15	250	(280)S	250	250	(270)S	280	320	420	380	410	430	380	[380]A	370	480	390	410	350	300	270	250	230	A	A
16	(280)S	(280)S	(280)A	(300)SA	(280)S	(270)A	A	A	A	A	A	A	480	[440]A	400	420	320	320H	300	250	240	(250)A	(280)S	(270)A
17	270	260	250	(250)S	250	230	230	[240]A	260	230	330	360	360	440	430	(350)H	350	350	290	230	230	230	250	260
18	250	250	260	(250)S	(270)S	230	G	G	450	310	400	350	390	450	430	390	350	350	270	260	(250)A	240	260	(280)A
19	[280]A	(280)A	(280)A	(280)A	[270]A	260	250	G	300	320	350	350	460	390	G	410	360	320	260	(240)A	(270)A	A	A	A
20	(290)A	[270]A	260	240	280	270	210	G	A	330	370	A	G	450	390	[370]A	350	A	A	270	230	(270)A	270	260
21	[270]A	280	280	[280]A	(270)S	250	G	(270)H	A	C	320	360	[370]A	380	(320)A	400	360	310H	(280)A	A	A	(230)A	[250]A	280
22	260	(240)A	(300)A	280	230	(260)A	(240)A	G	G	330H	(350)A	440	400	[400]C	390	410	350	350	[300]A	250	220	250	230	230
23	280	280	270	240	(280)S	250	210	G	G	G	G	600	G	G	G	530	410	420	360	250	280	250	240	270
24	(290)S	(300)S	(300)S	A	A	(270)S	250	G	400	G	A	(470)H	480	460	440	430	350	310	280	250	220	(250)S	(250)S	(250)S
25	(310)A	(290)A	(290)B	S	S	220	220	(380)S	(490)S	500	(380)A	360	520	390	A	A	330	330	(310)A	(230)A	(250)S	250	250	(260)S
26	(250)S	(290)S	(310)A	270	[300]S	(320)S	230	G	G	G	G	GA	G	GA	G	G	G	410	340	230	(270)S	250	(250)S	(270)S
27	(300)S	[300]S	(310)S	E	F	S	230	G	G	G	G	G	G	G	G	G	390	320	(300)L	260	230	270	(280)S	(290)S
28	(330)S	(300)S	S	E	E	(270)S	250	G	G	G	G	G	G	G	G	G	A	380	310	220	240	(290)S	(290)S	(300)S
29	280	[280]S	270	(310)S	S	S	G	G	G	G	G	G	G	G	G	G	450	360	290	250	(260)S	(260)S	[280]A	(260)S
30	(280)S	[280]S	(300)A	S	A	A	A	G	G	G	G	G	G	G	GA	390	400	440	300	240	240	(280)S	(310)S	(300)S
31	(300)A	270	250	[300]S	[300]S	(310)S	430	G	G	G	G	470	480	G	G	G	G	A	300	260	230	(250)S	270	270
Median	(270)	(280)	(280)	(280)	(280)	260	(300)	G	G	G	440	G	G	520	G	430	360	350	300	250	240	250	250	260
Count	29	29	28	25	23	27	28	28	25	26	28	26	29	30	27	29	26	27	30	30	30	29	28	27

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 62

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

foF2 (Characteristic), Mc (Unit), JULY (Month), 1953

Observed at Washington, D.C.

Lat 38.7°N, Long 77.1°W

75° W Mean Time

National Bureau of Standards (Institution)

Scaled by: McC., E.J.W.

Calculated by: McC., E.J.W.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	3.1 J F	3.1 S	2.9 S	(2.6) P	(2.4) S P	2.6	<3.0 G	<3.3 G	<3.6 G	<3.8 G	4.2	<4.1 G	<4.1 G	<4.2 G	<4.1 G	<4.0 G	4.3	(4.2) S	4.6	4.6	4.6	4.7	4.2 J S	3.9
2	3.3	3.4 S	(2.7) P S	(2.2) J S	(2.0) S S	2.6 S	3.6 S	<3.4 G	<3.7 G	<3.9 G	(4.2) H	<4.1 G	<4.1 G	<4.1 G	A	4.4	5.0	5.0 H	4.7	4.5	4.5	4.2	4.0 S	3.3 J S
3	3.0	2.8	2.3	(1.9) P S	(1.6) J S	2.4	<2.9 G	3.7	A	A	(4.4) P	<4.0 G	<4.1 G	<4.0 G	<4.0 G	4.3	4.6	[5.0] A	5.2	4.4	4.2	3.9	(3.4) S	3.4
4	2.8	2.5	2.3	1.9	[2.2] A	2.5	3.3	A	A	4.7	<4.0 G	<4.0 G	<4.2 G	4.5	<4.0 G	4.8	5.2	4.8	4.4	4.6	4.9	4.3	3.1	2.8 F
5	2.6	2.2	2.1 J S	2.0	(1.7) J S	(2.3) S	<3.0 G	<3.4 G	<3.7 G	<3.9 G	<4.0 G	<4.1 G	<4.2 G	<4.2 G	<4.1 G	<3.9 G	A	4.3	5.2	4.7	5.0	(4.5) S	4.0 J S	3.8 J S
6	3.2 J S	(2.8) J S	(2.1) S	(2.2) S	(2.0) J S	2.7	<3.1 G	<3.5 G	<3.8 G	<4.2 G	<4.0 G	<4.1 G	4.5	4.8	5.0	4.7	4.8 H	4.7	4.7	5.2	5.4 S	4.8 J S	(4.8) J S	3.5 F
7	(3.4) J S	2.9 J S	2.9	2.5 J S	2.1	2.6	3.3	3.7	<3.9 G	A	(4.3) A	<4.1 G	A	[4.7] A	[4.8] A	A	A	A	4.4	4.2	4.8	4.9	4.1	(3.0) S
8	2.1 J S	1.8	1.6	1.6 J S	1.7	2.6	3.6	<3.5 G	4.3	4.7	4.6	A	A	<4.2 G	<4.1 G	5.1	5.2	[5.4] A	5.6	[5.4] A	(5.2) S	S A	A	A
9	(2.4) A	(2.1) S	1.8	2.0	1.7	2.9	3.6	4.0 J S	<3.8 G	<4.0 G	4.8	4.7	<4.2 G	<4.2 G	A	4.5	5.1	5.0	5.0	5.8	5.8	4.7	3.7	(3.1) A
10	2.7	2.5	2.7	2.1	2.0	2.7	3.3	4.0	4.3	4.3	4.7	A	<4.3 G	4.8	4.8	4.7	4.8	4.7	4.5	5.2	5.5	4.2	3.7	3.2 J A
11	A	A	2.7	2.4	[2.4] A	2.9	4.2	A	[4.8] A	4.8	5.3	5.0	(5.2) S	5.4	5.2 J A	5.0	[4.8] A	4.7	4.8	5.4	5.8	5.0	3.9	3.6
12	3.2	3.2	(2.6) P S	2.4 F	2.3 J S	3.0	<3.4 G	<3.6 G	4.4	A	A	A	5.1	5.2	[5.0] A	4.9	[5.6] M	6.4	7.0	5.8	5.8	5.2	4.6 J S	3.8
13	2.8	[2.1] A	2.0	(1.9) A	1.9 J F	2.4	<3.3 G	[<3.5 G] A	<3.8 G	<3.9 G	<4.2 G	<4.2 G	<4.2 G	[<4.2 G] A	<4.1 G	<3.9 G	4.2 J A	4.5 H	4.3 H	4.0	4.0	(4.1) J S	(3.2) S	(3.3) F S
14	[2.6] A F	2.4 F	2.2 J F	1.9 J F	(1.8) F S	2.6 J	3.4 J S	4.2	4.7	4.7	5.0	(5.2) A	5.2	5.0	(4.6) M	5.1	5.1	5.4	5.1	5.5	5.4	5.4	4.8	4.5
15	3.8	3.2	3.0	2.5	2.1	2.6	3.3	4.2	4.1	4.5	4.8	4.8	[4.9] A	5.0	4.7	4.8	4.7	4.9	4.8	4.9	5.0	4.3	[3.2] A	[2.8] A
16	2.8	2.7	2.5	2.3	2.1 J F	2.6	A	A	A	A	A	A	4.8	[5.0] A	4.9	4.9	5.2	5.1 H	5.0	5.4	5.7	4.8	3.8	3.4
17	2.9	3.0	2.7 F	2.4	2.3	2.9	3.8	4.5	5.6	5.4 J A	5.2	5.2	5.2	4.7	4.9	(4.9) H	5.0	5.0	5.2	5.0	5.2	4.8	4.1	3.8
18	(3.5) S	3.4	2.9	2.4	2.3	2.8	<3.6 G	<3.7 G	4.3	5.0	4.9	5.2	5.0	4.8	4.9	4.9	4.8	4.7	5.0	5.2	5.3	4.7	4.0	3.8
19	[3.4] A	3.1	2.8	2.5 J A	2.3	2.7	3.5	<3.6 G	5.4	5.2	5.2	5.0	4.8	5.0	<4.2 G	4.9	5.0	5.6	5.8	5.6	4.8	[4.8] A	A	A
20	(3.8) A	[3.4] A	3.1	(2.9) S	2.3	2.6	3.6	<3.7 G	A	4.9	4.9	A	<4.3 G	4.7	4.7	4.7	4.9	[4.8] A	(4.8) A	5.4	5.4	(4.2) S	3.6	3.3
21	[3.0] A	(2.7) S	2.4 F	[2.2] A	2.0 F	2.5	<3.3 G	4.4 J N	A	C	(5.0) A	5.1	[5.0] A	5.0 J H	[5.0] A	5.0	4.9	5.2 H	5.8	A	A	5.3	[4.7] A	4.1
22	3.1 F	3.2 F	2.5 F	(2.4) A S	[2.2] S	(2.9) A	3.7 J A	<3.9 G	<4.0 G	(5.3) H	(4.7) A	4.9	5.0	[5.0] C	4.9	4.8	5.0	5.2	[6.0] A	6.8	6.8	5.8	4.8	(4.2) S
23	3.5	2.5	2.9	2.5	2.4	2.3	3.1	<3.4 G	<3.5 G	<3.7 G	<3.9 G	4.3	<4.0 G	<4.0 G	<4.0 G	4.5	4.8	4.9	5.6	6.4	6.0	5.6	4.2	3.1
24	2.8 F	1.9 J F	1.7 J S	A	A	2.2	2.9	<3.2 G	4.2	<4.0 G	[4.6] A	(4.5) H	(4.5) A	(4.6) P	4.7	4.6	4.7	4.9	4.9	4.7	4.7	3.7	3.3 S	3.1
25	2.5	2.5	(2.4) P B	(2.0) P S	(1.8) P S	2.5	3.3	(3.9) P S	(4.0) H	4.2	(4.5) A	4.7	4.6	4.9	[5.0] A	5.1 J A	4.8	4.6	4.9	4.9	5.0	5.2	4.5	4.1
26	3.6 F	3.2	(2.9) J S	2.4	(1.8) P S	(2.1) P S	(2.7) J S	<3.2 G	<3.5 G	<3.6 G	<3.8 G	[<3.9 G] A	<4.0 G	[<4.0 G] A	<3.9 G	<3.9 G	<3.8 G	(4.2) P S	4.2	4.6 F S	4.2	4.5	3.5	2.9
27	2.5	2.2 J S	1.9 J S	<1.0 E	<1.0 E	(2.1) P S	2.9 F	<3.1 G	<3.5 G	<3.6 G	<3.7 G	<3.9 G	<4.0 G	<3.9 G	<3.9 G	<3.8 G	4.3	3.9	4.2	3.9 J S	3.7	3.2	2.6 J S	2.4 J S
28	(2.5) F J	(2.6) J F	F S	<1.0 E	<1.0 E	(2.3) P F	2.7 F	<3.3 G	<3.5 G	<3.7 G	<3.8 G	<4.0 G	<4.0 G	<4.0 G	<3.9 G	<3.9 G	[4.4] A	4.3	4.4	4.3	3.8	3.2	2.7 J S	(2.5) S
29	2.7 J S	(2.2) P F	2.2 J F	(1.7) J S	S	S	<2.8 G	<3.1 G	<3.5 G	<3.8 G	<3.9 G	<4.0 G	<4.0 G	<4.0 G	<3.9 G	<3.8 G	4.1	4.1	4.2	3.8	3.6	3.1 J S	3.1	2.9 J S
30	2.4 S	(2.3) P S	2.0	[1.8] S	A	A	(2.8) J A	<3.2 G	<3.6 G	<3.7 G	<3.8 G	<4.0 G	<4.0 G	<4.0 G	[<4.0 G] A	4.4	4.3	4.0	4.3	4.1	4.2	3.0	2.6	2.5
31	2.7	2.6	2.2 J S	1.9 J S	1.7 J S	2.0	(3.1) S	<3.4 G	<3.6 G	<3.9 G	<4.0 G	4.4	4.4	<4.1 G	<4.0 G	<4.0 G	<3.9 G	[4.4] A	4.5	4.3	3.9	3.2 J F	2.9	2.8
Median	2.8	2.6	2.4	2.2	2.0	2.6	3.3	<3.6	<3.8	<4.1	(4.4)	<4.2	<4.3	(4.6)	(4.6)	4.7	4.8	4.8	4.8	4.9	5.0	4.6	3.8	3.3
Count	30	30	30	30	28	29	30	28	26	26	29	26	29	31	29	30	29	30	31	30	30	30	29	29

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 63

Central Radio Propogation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

foF2 (Characteristic), Mc (Unit), JULY (Month), 1953

National Bureau of Standards (Institution)

Observed at Washington, D.C.

Lat. 38.7°N, Long. 77.1°W 75°W Mean Time

Scaled by: McC., E.J.W.

Calculated by: McC., E.J.W.

Day	0030	0130	0230	0330	0430	0530	0630	0730	0830	0930	1030	1130	1230	1330	1430	1530	1630	1730	1830	1930	2030	2130	2230	2330
1	2.9 F2	(3.0) F2	(2.8) F2	(2.6) F2	(2.2) F2	<2.8 G	<3.1 G	<3.5 G	<3.7 G	<3.9 G	<4.0 G	<4.0 G	4.4	<4.2 G	<4.0 G	4.3	4.3	4.4	4.9	4.4	4.7	(4.8) F2	(4.0) 3	3.8
2	(3.3) 3	3.2 3	2.3	(2.2) 3	2.0 3	3.0	<3.3 G	<3.6 G	<3.8 G	<4.0 G	4.2	<4.2 G	<4.2 G	4.5	A	[4.7] A	4.9	4.8	4.7	4.5	4.3 3	4.0	3.6	3.2
3	3.1	2.5	2.1	(1.8) 3	(1.9) 3	2.8	(3.2) A,4	A	A	4.5	<4.0 G	[<4.0 G] A	[<4.0 G] A	[<4.0 G] A	4.4	4.4	4.9	5.0	5.0	4.4	4.1 3	3.7	3.6	3.0
4	2.3 3	2.3	A	A	A	3.0	<3.3 G	<3.7 G	4.4	A	A	<4.2 G	<4.2 G	<4.1 G	4.8	5.2	5.2	4.7	4.4	4.8	5.2	(3.2) 3 N	3.0	2.6
5	2.3	(2.2) 3	2.1 3	2.0 3	[2.0] 3	2.7	<3.3 G	<3.5 G	<3.9 G	<(4.0) G	<4.0 G	[<4.2 G] 3	<(4.2) G 3	<4.2 G	<4.1 G	A	4.3	4.8	4.9	4.7	(4.8) 3	4.2 3	3.7 3	3.3
6	3.1	2.5 3	2.2 F	[2.1] 3	2.1 3	3.0	3.7	4.1 3	4.9	<(4.2) G 3	<4.1 G	<4.2 G	4.5	4.8	5.0	4.8	4.8 3	4.8	4.8 3	5.7	5.0 3	(4.7) 3	3.8 3	3.4 F3
7	3.2 F	(2.8) F	2.7 3	2.4	2.3	3.0	<3.4 G	4.0	4.4	A	A	A	(4.5) A	4.8	4.7	[4.8] A	4.8	[4.6] A	4.3	4.2	5.1	5.0	3.4	2.6
8	1.8	1.7	1.6 3	1.6	2.1	3.0 F	<3.3 G	4.0	(4.3) 3	(4.8) P	4.7	<4.3 G	A	4.3	4.7	5.3	[5.4] A	5.5	[5.6] A 3	(5.6) A 3	A	A	A	A
9	[2.2] A	[2.0] A	[1.9] A	1.9	2.3	3.4	4.0	4.1	<3.9 G	<4.0 G	5.0	A	<4.2 G	<(4.1) A G	4.4	(4.6) 3	5.0	5.2	5.4	5.5	5.6	4.0	3.4 M	2.9
10	2.6	2.4	2.2	2.0 F	2.1 3	<3.0 G	<3.5 G	4.2	<4.0 G	4.5	4.8	<4.3 G	<4.3 G	4.8	4.8	4.6	4.7	4.3	4.8	5.5	5.1	4.0 3	3.3	(2.7) A
11	[2.8] A	(2.4) F	[2.4] A	2.4	2.3	(3.7) A	[4.1] A	4.5	(5.0) A	5.2	(5.1) 3	5.6	5.0	(5.4) A	4.6	4.8	4.9	4.7	5.1	5.8	5.6	4.3	3.6	3.5
12	3.2	3.1	2.5 F	2.7 F	2.4	3.3	<3.6 G	<3.8 G	A	A	A	A	5.4	5.7	5.0	[5.4] M	6.8	7.0	6.5	5.7	5.4	5.4	3.3	3.4
13	2.4	1.9 3	[1.8] A	(1.8) F	1.8 F	3.0	<3.2 G	<3.7 G	<3.8 G	<4.0 G	<4.2 G	[<4.2 G] A	A	A	<4.0 G	<3.9 G	4.3	4.6	4.1	4.0	(3.9) 3	(4.0) 3	(3.3) 3	2.8 F
14	2.5 F	2.2 F	(2.0) F	[2.0] F	2.0 F	3.1	3.8 3	4.3	4.8	5.4	5.1	[5.2] A	5.1	5.0	4.8	5.4	5.2	5.2	5.5	5.6	5.4	5.2	4.3	4.2
15	3.3	3.1	2.7	2.4	2.2	3.0	<3.3 G	4.3	4.8	4.8	5.5	A	<4.3 G	4.8	4.7	4.6	4.6	5.0	4.8	5.4	4.8	3.7	2.8	2.8
16	2.8	2.5	2.4	2.1 F	2.1	A	A	A	A	5.1	A	A	5.1	4.8	5.2	[5.0] A	5.2	4.9	6.3	(5.7) A	(5.0) 3 A	(4.2) 3	3.5	3.3
17	3.0	2.8 F	2.6	2.5	2.3	3.5	[4.2] A	5.0	5.0	5.3	5.4	5.3	5.0	4.6	4.9	4.9	5.0	5.2	5.2	4.9	4.8 3	4.2	3.9	3.6
18	(3.3) 3	3.0	2.8	(2.6) 3	(2.4) 3	3.4	4.2	4.2	4.8	5.0	5.0	5.2	5.0	4.9	4.9	4.7	4.8	5.0	4.9	5.4	5.0	4.3	3.8 3	3.5
19	[3.2] A	3.0	2.6	[2.4] A	[2.5] 3	3.2	4.2	5.0	4.5	[5.2] A	4.8	<4.4 G	4.6	(4.9) 3	<4.2 G	5.0	5.4	6.0	5.8	4.9	5.0	4.6	A	A
20	A	(3.2) A	3.1	(2.4) 3	2.2	(3.1) A	4.0	4.0	4.5	[4.9] A	4.9	4.6	<4.3 G	4.9	4.8	[4.8] 3 A	5.0	4.9 Fh	[5.1] A	(5.4) H	5.0	4.0 A	3.4 3	3.2
21	2.8 F	2.7	[2.4] A	(2.0) 3	[2.2] A	2.9	3.8 3	A	C	C	[5.0] A	A	5.2	5.4	(4.9) A	4.8 M	5.0	5.4	5.8	[5.8] A	5.7	4.5	4.2 A	4.0
22	3.5 F	(2.8) 3	2.3 F	2.2	2.2 3	[3.3] A	A	A	4.8	5.2	4.9	5.1	4.9	[4.9] C	5.0	4.8	5.0	5.4	6.4	6.6	5.8	4.9	4.7	3.6
23	3.1	2.5	3.1	2.4	1.9	3.0	<3.3 G	<3.4 G	<3.7 G	<3.8 G	<3.9 G	<4.0 G	<4.0 G	<4.0 G	4.3	4.5	5.0	5.3	6.3	(6.0) 3	5.7	4.9	3.5	2.9
24	2.3 F	2.0	A 3	A	A	(2.8) A	<3.1 G	A	<3.9 G	4.4	4.7	(4.5) A	<4.2 G	4.6	4.6	4.8	4.7	4.8	4.8	4.7	4.3	(3.6) 3	3.2 3	2.9 3
25	(2.5) F2	(2.4) F2	(2.1) G	[2.0] A 3	(1.9) 3	3.0	3.8 H	(4.2) H	[4.2] A	(4.3) 3	4.6	(4.7) H	4.8	[4.8] A	4.8	5.1	4.5	4.6	[4.9] A	5.0	5.2	5.0	4.2 3	(4.0) 3
26	3.5 F2	(3.1) 3	2.8	[2.1] 3	(1.9) 3	(2.5) 3	(3.0) 3	<3.5 G	<3.7 G	<3.6 G	A	A	<4.0 G	(4.0 G	[<3.9] A	<(3.8) G	(4.0) 3	4.7 F	(4.5) F	4.4	4.3	4.0	3.2	(2.6) 3
27	2.4 3	2.1 3	1.8 3	<1.0 E	<1.0 E	(2.5) F	<3.1 G	[3.4 G] A	<3.6 G	<3.7 G	<3.9 G	<4.0 G	<3.9 G	<3.9 G	<3.8 G	<3.8 G	4.4	4.3	4.0	3.8	3.4	2.9	2.5 F3	(2.3) F
28	(2.5) F2	(2.5) F2	<1.0 E	<1.0 E	<1.0 E	2.4	3.0	<3.4 G	<3.6 G	<3.8 G	<3.9 G	<4.0 G	<4.0 G	<4.0 G	<3.9 G	4.3	4.4	4.4	4.5	4.3	3.4	2.9	2.5	2.7 3
29	2.5	(2.1) A	2.0 3	(1.8) 3	<1.0 E	(2.6) 3	<3.0 G	<3.2 G	<3.6 G	<3.8 G	<3.9 G	<4.0 G	<4.0 G	<3.9 G	<3.9 G	<3.7 G	4.3	4.0	3.9	3.6	3.9 3	3.2	(3.9) F	2.7
30	2.4	2.2	(1.7) 3	A	A	2.6	<3.2 G	<3.4 G	<3.7 G	<3.8 G	<3.9 G	<4.0 G	<4.0 G	<4.0 G	<3.9 G	[4.4] A	[4.2] A	4.3	4.3	4.2	3.3	2.8	2.6	2.5
31	2.6	2.5	(1.9) 3	1.6 3	1.6 3	2.5	3.4 H	<3.5 G	<3.7 G	<3.9 G	4.4	4.4	<4.0 G	<4.1 G	4.3	4.2	4.3	4.5	4.3	4.2	3.5 F	3.2 F	3.0	2.6 3
Median	2.8	2.5	2.3	2.1	2.1	3.0	(3.4)	<3.9	(4.0)	(4.3)	4.6	<4.2	<4.3	(4.6)	4.6	4.8	4.8	4.8	4.9	4.9	5.0	4.1	3.4	3.0
Count	30	31	29	28	28	30	29	26	27	27	26	24	29	30	30	30	31	31	31	31	30	30	29	29

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 64

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form accepted June 1946

IONOSPHERIC DATA

h'F1 (Characteristic), Km (Unit), JULY (Month), 1953

Observed at Washington, D.C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: McC., E.J.W.

Calculated by: McC., E.J.W.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							240	220	220	200	210 N	210	(230) N	180 N	200 N	(230) A	220	210	230	230				
2							240 N	220	220	230 N	210	190 N	210	180	A	A	A	210	220	230				
3							210 N	220	A	A	200	220	200	200	(220) A	200	(230) A	A	A	230				
4							Q	A	A	A	A	200	200	220	210	200 N	200 N	200	210 N	240				
5							230	210	200	200 N	210	210	190 N	(200) N	200 N	A	A	220 N	220	220				
6							220	210	190	190 N	210	[210] A N	210	220	230	210 N	(200) F	[200] A	200	220				
7						210	240	220 N	210 N	A	A	A	A	A	A	A	A	A	A	230				
8							220	(220) A	(210) A	190	180	A	A	(230) A	220	200	A	A	A	A				
9							(200) A	200	200 N	200	200	[190] A	180	200	[190] A	180	200	220	210	A				
10							220	190 N	200	190	A N	A	200	190	200	210	210	210	230	A				
11							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
12							200	190 N	A	A	A	A	A	A	A	200	[210] N	230	A	A				
13							A	A	200	190	190	190	A	A	200 N	210	200	230	(220) A	A				
14							Q	A	(230) A	220	(230) A	180	190	230	(230) A	210	200	220	230	A				
15							220	210	220	210	200	180	A	A	200	[210] A	(220) A	200	210	A				
16							A	A	A	A	A	A	200	[200] A	180	A	A	200 N	A	A				
17						200	Q	A	A	A	180	180 N	170	210	190	210	(220) A	220	220					
18							210	200	220	200	210	220	200	210	200	(220) A	220	A	A					
19							A	200	200	A	A	A	200	210 N	200	220 N	200 N	[220] A	230					
20							Q	200	A	A	200	[200] A	200 N	200	180 N	A	A	A	A					
21							230	200 N	A	C	A	A	A	200	(200) A	(200) A	200 N	230	A					
22							A	200	(200) A	200	[190] A	180	(240) A	[220] C	210	210	200	220	A					
23							Q	210 N	210 N	220	200 N	210	220	200	230	210	220	220	220	240				
24							Q	200	(220) A	(230) A	[220] A	(220) A	210	210	210 N	210 N	210	200	A					
25							Q	210 N	210	200	190	(210) A	(200) N	(210) A	A	A	(220) A	A	A					
26							Q	220 N	220	(220) A	A	A	210 N	[200] A	200 N	(230) A	200 N	210	210 F					
27							Q	200	(210) A	190 N	190 N	210	210	200 N	200	210 N	240	220	220					
28							Q	210	200	200	190	170	200	210	210	210	[220] A	220	210			-		
29							240	200	(230) A	230	240	[200] A	200	(200) A	210	210 N	210	210 N	(220) A					
30							Q	210	230	200	[210] A	200 N	200	200	A	A	A	A	(220) A					
31							220	210	220	(220) A	220	190	210	200	210	200 N	210 N	A	A					
Median							220	210	210	200	200	200	200	200	200	210	210	220	220	230				
Count						5	15	25	23	21	22	22	24	26	25	23	23	22	15	8				

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 65

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form accepted June 1946

IONOSPHERIC DATA

foF1 (Characteristic), Mc (Unit), JULY (Month), 1953

National Bureau of Standards (Institution)

Observed at Washington, D.C.

Lat 38.7°N, Long. 77.1°W

75° W Mean Time

Scaled by: McC.

Calculated by: McC.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							3.0	3.3	3.6	3.8	(4.0)H	4.1	4.1H	(4.2)H	4.1H	4.0	3.8	3.7	3.4	L				
2							L H	3.4	3.7	3.9H	4.0	4.1H	4.1	4.1	A	A	3.7	3.6	3.3	L				
3							2.9H	3.4	A	A	4.0	4.0	4.1	4.0	(4.0)A	3.9	3.8	[3.6]A	3.4	L				
4							Q	A	A	A	4.0AJ	4.0SJ	4.2	4.1	4.0	4.0H	3.9H	3.7	3.4H	L				
5							3.0	3.4	(3.7)S	3.9H	(4.0)S	4.1	4.2H	(4.2)H	(4.1)H	3.9	[3.8]A	3.7H	3.4	L				
6							3.1	3.5	3.8	4.2H	4.0	4.1H	4.2	4.1	4.1	4.1H	4.0H	3.7	3.3	L				
7						L	(3.0)P	3.4H	3.9H	A	A	4.1	A	A	A	A	A	A	A	L				
8							3.1	3.5	3.8	4.0	4.1	A	A	(4.2)H	4.1	4.0	A	A	A	A				
9							L	3.7	3.8H	4.0	4.1	(4.2)A	4.2	4.2	[4.1]A	4.0	3.9	3.7	3.4	A				
10							L	3.4H	3.9	4.0	4.1H	[4.2]A	4.3	4.2	4.2	4.1	4.0	3.7	3.4	L				
11							A	A	A	(4.0)A	A	A	A	A	A	A	A	A	A	A				
12							3.4	3.6H	A	A	A	A	A	A	A	4.1	[3.9]H	3.8	L	A				
13							3.3	[3.6]A	3.8	3.9	4.2	4.2	(4.2)A	[4.2]A	4.1H	3.9	3.7	3.6	3.4	L				
14							Q	3.7	4.0	4.2	4.2	(4.3)A	4.3	4.3	4.3	4.2	4.1	3.8	3.5	L				
15							2.9	3.4	3.8	4.0	4.3	4.3	A	A	4.2	[4.0]A	3.9	3.7	3.4	L				
16							A	A	A	A	A	A	4.4	[4.3]A	4.2	(4.2)A	(4.0)A	3.9H	3.5	L				
17						1.8	Q	A	A	A	4.3	4.4H	4.4	4.3	4.3	(4.1)A	4.0	3.8	3.4					
18							3.6	3.7	3.9	4.1	4.2	4.3	4.4	4.3	4.3	4.2	4.0	3.7	A					
19							A	3.6	4.0	(4.1)S	A	A	4.4	4.3H	4.2	4.1H	4.0H	3.9	3.4					
20							Q	3.7	[3.8]A	4.0	S	A	4.3H	4.2	4.2H	[4.1]A	4.0	A	A					
21							3.3	3.6H	A	C	4.1	4.2	[4.2]A	4.3	4.3	4.2	4.0H	3.8	A					
22							A	3.9	(4.0)A	4.1	[4.2]A	4.3	4.3	[4.3]C	4.2	4.2	4.0	3.7	A					
23							Q	3.4H	3.5H	3.7	3.9H	4.0	4.0	4.0	4.0	3.9	3.6	3.4	3.1	L				
24							Q	3.2	3.7	4.0	[4.1]A	4.2	4.2	4.2H	(4.2)H	(4.0)H	4.1	3.7	A					
25							Q	(3.6)H	3.8	4.0	(4.0)P	4.1	4.2H	4.2	A	A	3.8	3.6	A					
26							Q	3.2H	3.5	3.6	3.8	[3.9]A	4.0H	[4.0]A	3.9H	3.9	3.8H	3.5	3.2					
27							Q	3.1	3.5	3.6H	3.7H	3.9	4.0	3.9H	3.9	3.8H	3.7	3.5	L					
28							Q	3.3	3.5	3.7	3.8	4.0	4.0	4.0H	3.9	3.9	[3.7]A	3.5	3.2					
29							2.8	3.1	3.5	3.8	3.9	[4.0]A	4.0	4.0	3.9	3.8H	3.7	3.5H	3.2					
30							Q	3.2	3.6	3.7	3.8	4.0H	4.0	4.0	[4.0]A	3.9	[3.7]A	3.5	3.2					
31							2.9	3.4	3.6	3.9	4.0	4.1	4.1	4.1	4.0	4.0H	3.9H	[3.6]A	(3.2)A					
Median						—	3.0	3.4	3.8	4.0	4.0	4.1	4.2	4.2	4.1	4.0	3.9	3.7	3.4	—				
Count						1	13	27	24	24	25	25	26	27	26	27	28	27	20					

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 66

Central Radio Propogation Laboratory, National Bureau of Standards, Washington 25, D. C.

Form adopted June 1946

IONOSPHERIC DATA

h' E (Characteristic), Km (Unit), JULY (Month), 1953

Observed at Washington, D.C.

Lat 38.7°N, Long 77.1° W

75° W Mean Time

National Bureau of Standards (Institution)

Scaled by: McC., E.J.W.

Calculated by: McC., E.J.W.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							(120)S	110	110	110	110	110H	(110)S	110H	110	(110)S	110	110	(120)S	S				
2							A	110	110	110	110	100N	100	100	100	100	[100]A	100H	110	S				
3							(130)A	110	110	100	100	100	110	110	110	110	110	110	110	S				
4							120	110	110	110	110	110	110	110	110	110	110	120	120	H S				
5							120	110	110	110	110	110	110	110	100	110	110	110	120	S				
6							110N	110	110	100	100	100	100	100	100	100	110	110	110	S				
7							120	100	100	100	100	110	100	100	110	110	100	110	110	S				
8							120	100	110	100	100	(100)A	100	100	100	100	110	110	110	A				
9							A	110	110	110	100	100	110	100	100	100	100	110	110	A				
10							110	110	110	110	110	100	100	100	110	110	110	(110)A	110	120				
11							A	A	A	A	(100)A	100	100	[100]A	100	100	110	110	120	A				
12							A	A	110	110	100	100	100	110	110	110	[110]M	110	110	S				
13							5	110	110	(110)A	100	100	110	110	110	110	110	110	110	S				
14							120	110	110	110	100	110	110	110	110	110	110	110	120	120				
15							120M	110	110	100	100	A	B	A	110	100	100	110	A	A				
16							110	110	100	100	100	100	A	A	100	100	100	110	110	A				
17						S	110	100	100	100	100	A	A	100	110	110	A	A	A	A				
18							A	A	100	100	100	100	100	110	100	100	110	110	110					
19							A	110	100	100	100	100	100	100	100	100	110	110	110					
20							A	110	100	100	100	100	100	100	100	A	A	A	(110)A					
21							110N	110	A	C	100	100	100	100	100	100	100	100	110					
22							A	A	A	100	100	100	100	[100]C	100	100	100	100	100					
23							110	100	100	100	100	100	100	100	100	100	100	100	110	110				
24							A	110	100	100	100	100	A	A	100	[100]A	100	100	(110)S					
25							S	110	110	100	100	(100)B	100	100	[100]B	110	100	[100]A	110					
26							S	100	100	100	100	[100]A	100	100	100	100	100	110	110					
27							S	110	110	100	110	100	100	100	100	100	110	110	110					
28							(110)S	110	110	100	100	100	100	100	100	110	100	110	110H					
29							(120)S	110	100	100	100	[100]A	100	(130)B	A	A	(110)B	110N	(120)S					
30							A	A	110	110	100	100	100	100	100	(100)A	110	110	A					
31							S	110	100	110	110	100	100	110	100	100	110	110	110					
Median							120	110	110	100	100	100	100	100	100	100	110	110	110	--				
Count							16	26	28	29	31	29	27	28	30	29	29	29	28	3				

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 67

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D. C.

Form accepted June 1946

IONOSPHERIC DATA

foE (Characteristic), Mc (Unit), July (Month), 1953

Observed at Washington, D. C.

Lat. 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: Mc C., E. J. W.

Calculated by: Mc C. E. J. W.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							(2.1)H	(2.4)A	2.7	2.8	3.0	3.1 H	(3.1)P	(3.1)H	3.0	2.7	2.9	2.7	2.2	S				
2							A	2.4	2.6	2.8	2.8	(2.9)P H	(3.2)P	(2.9)P	2.9	A	A	(2.5)H	(2.3)S	S				
3							(1.9)A	2.4	2.7	2.8	3.2	3.2	3.2	3.2	3.1	3.1	2.9	2.5	2.2	1.6				
4							1.8	2.2	2.6	2.9	3.0	A	A	3.3	3.2	3.1	2.9	2.7	2.2	(1.7)H				
5							2.2	2.3	2.7	2.9	A	A	3.2	[3.2]A	3.2	3.1	2.8	2.5	2.3	A				
6							2.1 H	2.5	2.8	2.9	3.1	3.2	3.3	3.3	3.2	3.1	2.9	2.6	2.2	S				
7							1.8	2.3	2.6	2.8	[2.9]A	3.0	3.0	3.2	3.1	3.0	2.8	2.5	2.2	S				
8							2.0	2.4	2.6	3.0	3.1	A	A	3.2	3.3	A	A	A	A	A				
9							A	A	A	A	A	A	A	A	A	A	2.9	2.6	2.2	A				
10							A	2.5	2.7	2.9	3.1	A	A	A	A	A	2.8	2.7	2.2	(1.7)P				
11							4	A	A	A	A	3.3	A	A	3.1	3.2	3.0	2.7	2.3	A				
12							A	A	A	3.0	3.1	3.2	3.3	3.2	3.1	3.0	[2.8]M	2.7	2.3	S				
13							A	2.3	2.5	A	A	3.3	3.3	3.3	3.2	3.1	2.9	2.5	2.2	A				
14							2.0	2.5	2.7	3.0	3.1	A	A	A	3.3	3.1	3.0	2.7	2.2	1.6				
15							(2.0)H	2.2	2.7	[2.9]A	(3.1)A	A	B	A	3.2	3.1	2.8	2.5	A	A				
16							2.0	2.5	2.7	(3.0)A	A	A	A	A	3.3	3.1	2.9	2.7	2.2	A				
17						S	2.2	2.4	2.7	(2.9)A	A	A	A	A	A	A	A	A	A	A				
18							A	A	A	3.1	3.1	A	A	3.2	3.3	3.1	2.9	2.6	2.2					
19							A	2.5	[2.7]A	2.9	A	A	A	3.3	3.3	3.2	3.0	2.7	2.3					
20							A	A	2.7	A	A	A	A	A	A	A	A	A	A					
21							2.0 H	A	A	C	3.0	A	A	3.3	3.3	3.2	3.0	2.6	2.3					
22							A	A	A	A	3.1	A	A	C	3.2	3.2	3.0	2.6	A					
23							A	2.4	2.6	[2.8]A	(2.9)A	A	A	3.2	3.0	A	A	A	(2.6)A	S				
24							A	2.7	A	A	2.9	3.0	A	A	(3.2)P	[3.0]A	(2.9)P	2.5	(2.1)P					
25							S	2.1	2.7	2.9	[3.0]A	(3.0)P	(3.1)P	A	B	3.1	(2.8)A	[2.4]A	(2.1)P					
26							(1.9)S	(2.4)H	2.6	(2.9)A	(3.0)H	[3.0]A	(3.1)B	(3.2)A	(3.1)P	[2.8]A	(2.5)A	2.5	(1.9)P					
27							S	2.3	2.5	(2.6)P	[2.3]B	(3.0)P	(3.1)P	(3.2)P	3.2	3.1	2.8	2.5	2.1					
28							A	2.2	2.5	2.8	2.9	3.1	A	A	A	3.0	[2.8]A	2.7	2.2 H					
29							1.8	2.3	2.5	2.7	A	A	A	A	A	A	2.7	2.4 H	2.1 H					
30							A	A	2.5	2.8	2.9	(2.9)P	(3.0)P	A	A	A	2.8	A	A					
31							A	2.3	2.6	2.8	2.9	3.0	A	A	3.2	(3.0)P	2.8	2.5	2.0					
Median							2.0	2.4	2.6	2.9	3.0	3.0	3.2	3.2	3.2	3.1	2.9	2.6	2.2	—				
Count							14	23	24	24	22	15	12	16	20	22	26	26	25	1				

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 68

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D. C.

Form adopted June 1946

IONOSPHERIC DATA

Es (Characteristic), Mc, Km (Unit), July (Month), 1953

National Bureau of Standards (Institution)

Observed at Washington, D. C.

Scaled by: Mc C., E. J. W.

Lat 38.7° N, Long 77.1° W — 75° W Mean Time

Calculated by: Mc C., E. J. W.

Doy	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	E	E	E	E	E	G	6.6/120	G	G	3.5/110	3.6/120	G	4.3/120 H	4.0/120	4.4y/110	G	G	G	G	E	E	E	5.7/120
2	(2.8) s (120)	E	E	E	E	E	2.0/110 H	5.9y/110	3.6y/120	3.1/120	3.2/120	3.2/120	4.2y/110	4.3/110	5.2/110	5.7/100	6.2/100	G	G	G	E	E	E	2.6/110
3	2.1y/110	E	E	E	E	E	4.4/110 H	3.6/110	8.4/110	8.8/100	G	7.0y/110	7.0/130	3.7/130	5.2/120	G	6.4/120	10.0/110 H	7.0/120	3.0/130	6.7/110	7.6/120 H	7.4/120	E
4	2.6y/130	3.8/120 H	5.5/110	3.4y/120	3.8/110	4.0/110	3.9/120	4.8/110	7.6/110 H	5.2/110	4.5y/110	4.5/110	4.3/110	G	G	G	G	G	G	G	3.0/120	E	2.7/110	3.8y/110
5	3.1/110	E	E	E	1.4.5/130	7.4/110	G	G	3.8y/120	7.0y/130	3.9/110	4.3/110	3.9/110	4.2y/110 H	G	5.4/120	11.7/120 H	7.0/120 H	G	2.9y/130	E	E	E	E
6	E	E	E	E	E	7.8y/110	(3.5) s /120	G	3.7/110	3.9/110	G	4.5/130 H	3.6/130	3.9/100	G	5.7/120	G	5.8/110	G	G	4.6/120	3.1y/120	E	E
7	2.3/120	E	E	E	E	E	G	G	6.3y/110	7.1/110	7.1/100	6.8y/110	9.1/110	15.0/100	12.0/110	7.4/110 H	16.0y/110	7.8/120	7.0/120	G	E	E	E	E
8	E	E	E	E	E	3.1/120 H	5.6y/120	4.1/110	6.6y/120	6.4/110	6.6/110	6.6/100 H	7.8/110	4.4/110	G	4.3y/120	6.0/110	8.8/110	7.8/110	8.4/110	6.6/110	7.4/110 H	7.0/110	6.6/110
9	3.8/110	4.8/100	4.4/100	3.3/100	2.4/100	1.5.0/110	3.2/100	3.7/120	7.0/120	6.2/120 H	7.8/120 H	7.0/100	6.4/110	5.5/110	6.2/110	4.2/120	G	G	G	3.0/120	E	E	3.2/110	6.2/110
10	3.3/110	E	E	2.5/130	1.8y/120	4.6/110 H	7.0y/130	G	3.5/110	4.3/110	4.7/120	6.8/110	4.8/110	3.7y/110	3.3/110	3.0/10	G	2.4/110	3.5y/120	3.2/120	4.8/120	4.3/110	3.2/10	4.7/110
11	8.4/110 H	6.6/110	6.4/110	4.8/110	6.1/100 H	5.1/100 H	6.6/100	12.5/100	2/110	5.8/100	6.7y/100	4.9/130	5.4/100	5.5/100 H	5.7/130	6.1/120	6.8/120	5.5/120	5.0/120	4.0/110	6.8/110	8.0/110 H	3.7/120	E
12	2.5/120	3.2/100	3.1/100	2.9/100	2.4/110	6.6/110	4.8/100 H	5.0y/110	4.8/120	7.6/110	9.9/11p	11.6/110	7.0/110	6.5/110	6.8/120	4.2y/120	M	G	4.9/20	4.5/120	7.6y/120	5.8/110	3.7/110	2.1/110
13	2.7/120 H	7.6/110 H	7.0/110 H	7.0/100 H	3.9y/130	E	4.5/120	7.6/110 H	4.3/110	5.1/110	4.2/110	3.5/110	4.7/130	3.9/130	6.6y/130	4.4y/130	4.3/130	3.7y/120	5.8/120	4.2/110	5.6/10 H	3.3/130	3.1/120	7.6/110
14	6.9/110	3.9/110	E	E	4.0y/110 H	E	G	4.8/120	5.2/120	4.8/120	5.2/110	5.6/110	5.2/120	4.6/120	4.7/130	G	G	G	3.5/120	3.3/130	3.3/110	E	3.0y/130	3.6/120
15	E	E	E	E	E	E	4.4y/110	3.6/120 H	4.3/110	4.7/110 H	4.3/110	7.0/100	6.8/100	7.2/100	3.7/130	5.0/120	7.2/110	6.8/110 H	7.0/110	4.6/120 H	7.4y/110	7.4y/120 H	6.6/110	4.0/110
16	2.8/110	2.4/110	4.8/110	4.0/100 H	3.9/110 H	3.7/110	6.5/110	7.2/110	11.0/100	9.8/100	7.6/100 H	8.0/110 H	7.0/100	7.0/100	5.0/110	7.6/120	9.7/120	8.1/120	4.2/110	5.0/110	9.0/100 H	9.0/100	4.2/110	4.3/100
17	4.8/110	2.9y/110 H	3.2y/100	3.1/110	7.2y/100 H	2.4/100	3.7/120	6.0/110 H	5.8/110	5.5/110	4.9/110	4.3/100	3.2/100	4.9y/110	3.3/110	4.4/110	4.2/100	3.5/100 H	3.7/100 H	4.0/110	3.2/110	3.7/120	2.9y/110	2.7/110
18	2.3/100	2.5/100	2.5y/100	2.7/100	4.8y/100	3.0/100	3.7/100	3.5/100	3.6/110	G	4.3y/110	5.2/110	6.6/110 H	5.2/110 H	5.6/120	4.8/120	7.0/120	4.3/120	7.0/10	7.0/110	4.8/10	3.5/110	3.2/110	4.5/110
19	5.0/100	4.2/100	6.2/110	4.4/110	4.5/100	6.8/100	8.8/110	1.0.0y/100	6.6/110	6.4/120	7.6/110 H	6.0/110	4.9/110	G	G	G	4.6/130	5.4/120	4.5/120	4.3/10	7.0/120	11.5/120	7.0/110	9.2/110
20	6.8/100	4.6/100	3.4/100 H	3.6/100	2.7/100	4.5/100	10.0/110 H	8.4/110 H	7.0/110	7.6/110 H	4.7/110	6.2/100	4.7/110	4.3/100	5.4/100	5.8/100	5.8/100	9.2/100	11.2/10	9.2/10	5.4/110 H	5.8/100	9.0/110	5.8/110
21	7.6/110	9.2/110	4.4/100	4.0/100	3.1/100	2.6/100	2.4/120	10.0y/110	11.0/110	C	9.0/110	9.8/110	6.0/110	11.5/110 H	9.0/110	7.4/120	4.2/140	4.3/20	5.0/120	17.0/110	13.2/110	4.8/110	5.8/110	4.5/100 H
22	4.2/100 H	6.3/100	4.0/100 H	3.9/100 H	7.0/100 H	6.4/100	7.0y/100 H	7.8/110	8.2/100	4.2/110	5.2/100	7.6/100	5.0/110	C	4.9y/120	G	3.4y/110	3.1/120 H	18.0/110	3.6/130	E	E	E	E
23	E	2.1/100	2.2/100	E	E	E	2.5/130 H	G	G	3.7y/120	4.0/100	4.3/100	3.9/100	3.3/110	4.1y/110	4.1/110	4.0/100 H	3.7/110	2.3/110	G	E	E	E	E
24	E	E	E	3.8/120	4.3/110	3.1/110	5.1/110	6.0/110	11.2/110	5.2/110	5.2/100	5.0/100	5.8/100	3.8/100 H	G	3.0/100	G	G	4.4/120	3.8/10	E	E	2.7y/110	E
25	4.0/100	3.5/100	1.8/100	2.7y/00	E	E	2.0/110	2.5/120	3.2/120	3.5/120	6.2/110	3.7/120	3.4/110	5.0/100	5.6/100	5.8/110	7.5/110	4.5y/10	5.8/120	2.0/140 H	E	E	E	E
26	E	E	2.8y/110	E	4.2/110	1.1/110	G	G	G	7.0/100 H	4.6y/110	11.0/110	4.2/120	6.2/120	G	7.6/120	3.7/110	G	2.0/110	E	E	E	E	E
27	E	E	E	E	E	E	1.9/130	G	4.2/110	3.8y/110	3.0y/110	3.5/110	G	G	G	G	G	G	G	E	E	E	E	E
28	E	E	E	E	E	2.4y/130	2.0/120	G	G	G	G	G	4.0/110	4.5/100	3.3/110	G	7.4/100	G	G	E	E	E	E	E
29	2.6/110	E	E	E	E	10.0y/100	2.2/120	3.5/120	4.4/110	3.8/110	4.3y/110	6.0/100	5.2/100	5.0/100	3.2y/100	2.8/100	G	G	2.5/120	E	E	3.8/110	3.5/110	2.3/110
30	E	E	3.0y/100	4.7y/120	3.3/100	4.2/100	2.1.0/100 H	3.5y/110	G	G	4.3y/120	4.2y/120	3.7y/110	3.6/110	6.8/110 H	5.6/100	7.0/120	5.6/120	2.4/120	E	E	E	E	E
31	4.1/110	3.2/110	E	E	E	E	2.9y/130	3.6y/120	3.8y/120	12.5y/120	4.5/110	4.2y/110	4.7y/110	3.8y/110	G	G	3.2/30	6.0/120	4.2/120	5.8/110	3.3y/00	4.2/100	E	E
Median	2.6	2.1	1.8	2.5	2.4	3.0	3.7	3.7	4.4	5.2	4.6	5.2	4.8	4.4	4.1	4.4	4.2	3.7	4.2	3.2	3.2	2.7	2.9	2.3
Count	31	31	31	31	31	31	31	31	31	30	31	31	31	30	31	31	30	31	31	31	31	31	31	31

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 69

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

(M1500)F2, ____ July, 1953
(Characteristic) (Unit) (Month)

Observed at Washington, D.C.
Lat 38.7°N, Lang 77.1°W

National Bureau of Standards
(Institution)

Scaled by: McC, E.J.W.

75°W Mean Time

Calculated by: McC, E.J.W

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	(2.0)F	(2.0)	(2.0)	(2.0)P	(2.4)D	2.3	G	G	G	G	1.8	G	G	G	G	G	1.9	(1.8)S	2.0	2.2	2.1	2.1	(2.1)S	1.9
2	2.0	2.0S	(2.0)S	(2.1)S	(2.0)S	2.2S	2.2S	G	G	G	(1.7)H	G	G	G	A	1.7	2.1	2.1H	2.1	2.1	2.2	2.0	2.1S	(2.1)S
3	2.0	2.2	2.0	(2.1)S	(1.9)S	2.2	G	2.1	A	A	(1.9)P	G	G	G	G	1.7	1.8	A	2.1	2.3	2.1	2.1	(2.2)S	2.0
4	2.1	2.1	2.3	2.1	A	2.2	2.3	A	A	2.0	G	G	G	1.6	G	1.8	1.9	2.0	1.9	2.0	2.0	2.2	2.0	2.0F
5	2.1	1.9	(1.8)S	1.9	(2.0)S	(2.2)S	G	G	G	G	G	G	G	G	G	G	A	1.8	2.2	2.2	2.1	(2.0)S	(2.0)S	(2.0)S
6	(2.1)S	(2.3)S	(2.0)S	(2.1)S	(1.9)S	2.3	G	G	G	G	G	G	1.8	2.1	2.2	1.9	2.2N	2.1	2.1	2.2	2.3S	(2.2)S	(2.2)S	2.0F
7	(2.0)S	(2.2)S	2.2	(2.2)S	2.0	2.4	2.4	1.9	G	A	(1.9)A	G	A	A	A	A	A	A	2.1	2.1	2.0	2.1	2.3	(2.2)S
8	(2.1)S	2.0	2.0	(1.9)S	1.9	2.3	2.3	G	2.2	2.1	2.2	A	A	G	G	2.0	2.1	A	2.2	A	(2.4)S	S A	A	A
9	(2.1)A	(2.3)S	2.0	2.3	2.2	2.2	2.1	(1.9)S	G	G	2.1	2.1	G	G	A	1.7	2.1	2.2	2.1	2.2	2.2	2.0	2.0	(2.1)A
10	2.0	2.0	2.0	2.0	2.1	2.0	2.2	1.9	2.0	1.8	2.2	A	G	1.9	1.7	1.9	2.1	2.1	2.0	2.2	2.3	2.1	2.1	(2.2)A
11	A	A	2.1	2.1	A	2.3	2.4	A	A	2.2	2.3	1.9	(2.0)S	2.2	(2.1)S	2.1	A	2.0	1.9	2.0	2.1	2.3	2.1	2.0
12	2.0	2.0	(2.3)P	2.1F	(2.2)S	2.4	G	G	1.8	A	A	A	1.8	1.8	A	1.8	M	1.9	2.1	2.2	2.1	2.0	(2.1)S	2.1
13	2.2	A	1.9	(1.9)A	(2.0)F	2.3	G	G A	G	G	G	G	G	G A	G	G	(1.8)F	1.9N	2.1H	2.0	2.0	(2.1)S	(1.9)S	(2.1)F
14	A F	2.0F	(2.2)F	(2.1)F	(1.9)F	(2.1)S	(2.3)S	2.2	2.1	2.0	2.0	(2.0)A	2.1	2.2	(1.8)A	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.0	2.0
15	2.2	1.9	2.2	2.2	2.2	2.1	2.2	1.9	2.2	2.2	1.8	2.2	A	2.2	1.7	1.9	1.9	2.2	2.2	2.1	2.3	2.2	A	A
16	2.0	2.0	2.0	2.0	(2.0)F	2.2	A	A	A	A	A	A	1.7	A	1.9	1.9	2.2	2.1H	2.1	2.1	2.1	2.2	2.1	2.1
17	2.2	2.1	1.9F	2.1	2.1	2.3	2.3	2.1	2.4	(2.1)A	2.1	2.2	2.2	1.9	1.9	(2.1)H	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.2
18	(2.2)S	2.2	2.2	2.2	2.1	2.3	G	G	1.8	2.1	1.9	2.2	1.9	1.8	1.9	1.9	2.2	2.2	2.3	2.2	2.1	2.1	2.2	2.2
19	A	2.1	2.2	(2.1)A	2.1	2.2	2.3	G	2.1	2.1	2.1	2.1	1.7	2.2	G	1.9	2.2	2.1	2.1	2.3	2.2	A	A	A
20	(2.1)A	A	2.2	(2.4)S	2.2	2.3	2.2	G	A	2.2	2.2	A	G	1.8	2.2	1.9	2.2	A	(2.1)A	2.1	2.1	(2.2)S	2.2	2.2
21	A	(2.2)S	2.1F	A	2.2F	2.3	G	(2.4)H	A	C	(2.3)A	2.1	A	(1.9)H	A	1.9	2.2	2.2H	2.1	A	A	2.2	A	2.1
22	2.2F	2.1	2.2F	(2.1)A S	S	(2.2)A	(2.3)J A	G	G	(2.3)H	(2.1)A	1.8	1.7	C	1.9	1.9	2.2	2.2	A	2.1	2.3	2.2	2.3	(2.4)S
23	1.9	2.2	2.2	2.1	2.2	2.1	2.4	G	G	G	G	1.6	G	G	G	1.6	1.8	1.7	1.7	1.9	1.9	1.9	2.2	1.9
24	1.9F	(1.9)F	(1.8)S	A	A	2.2	2.3	G	2.2	G	A	(1.7)H	(1.8)A	(1.8)P	1.8	1.8	2.1	2.2	2.2	2.2	2.2	2.2	2.1S	2.2
25	2.1	2.2	(2.2)P	(2.3)P	S	2.4	2.5	(2.2)P	(1.7)H	1.7	(2.2)A	2.1	1.7	2.2	A	(2.2)A	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.2
26	2.2F	1.9	(1.9)S	2.1	S	(2.2)D	(2.4)S	G	G	G	G	G A	G	G A	G	G	G	(1.9)S	2.2	2.2S F	1.9	2.1	1.9	2.2
27	1.9	(1.9)S	(1.9)S	E	E	(2.1)S	2.4F	G	G	G	G	G	G	G	G	G	1.9	1.8	2.2	(2.1)S	2.2	2.2	(2.2)S	(2.2)S
28	(1.8)F	(1.9)F	F S	E	E	(2.2)F	2.4F	G	G	G	G	G	G	G	G	G	A	1.9	2.2	2.2	1.9	(2.2)S	1.9	
29	(2.2)S	(1.7)F	2.2	(2.2)S	S	S	G	G	G	G	G	G	G	G	G	G	1.8	2.1	2.2	2.1	2.2	(1.9)S	2.2	(2.2)S
30	2.1S	(1.9)S	2.1	S	A	A	(2.3)A	G	G	G	G	G	G	G	G A	2.2	2.2	1.8	2.2	2.1	2.2	1.9	(1.9)S	1.9
31	2.2	2.1	(2.2)S	(1.9)S	(1.8)S	2.1	(1.9)S	G	G	G	G	1.8	1.8	G	G	G	G	A	2.2	2.2	2.1F	(2.2)F	2.2	2.2
Median	2.0	2.0	2.0	(2.1)	2.0	2.2	2.2	G	G	G	(1.8)	G	G	G	G	1.8	2.0	2.0	2.1	2.2	2.1	2.0	2.0	2.0
Count	27	28	30	26	21	29	30	28	25	26	28	26	27	28	25	30	26	26	30	29	30	29	27	28

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 70

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

(M3000)F2, ____, July, 1953
(Characteristic) (Unit) (Month)

Observed at Washington, D.C.
Lat 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards
(Institution)

Scaled by: Mc C., E. J. W.

Calculated by: Mc C., E. J. W.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	(30)F	(30)J	(30)J	(30)P	(34)JF	33	G	G	G	G	27	G	G	G	G	G	29	(27)S	30	32	31	31	(31)JS	29
2	30	30S	(30)PS	(31)JS	(30)JS	(32)PS	33S	G	G	G	(28)H	G	G	G	A	26	31	31H	31	31	32	30	31S	(31)JS
3	30	32	30	(31)PS	(28)JS	32	G	31	A	A	(29)P	G	G	G	G	26	27	A	31	33	31	31	(32)S	29
4	31	31	32	31	A	32	33	A	A	30	G	G	G	24	G	27	29	30	29	30	30	32	30	30F
5	31	29	(27)JS	28	(30)JS	(32)S	G	G	G	G	G	G	G	G	G	G	A	26	32	32	31	(30)S	(30)JS	(30)JS
6	(31)JS	(33)JS	(30)S	(31)S	(29)JS	33	G	G	G	G	G	G	27	31	33	28	32H	31	31	32	33S	(32)JS	(32)JS	30F
7	(30)JS	(32)JS	32	(33)JS	30	34	34	28	G	A	(28)A	G	A	A	A	A	A	A	31	31	30	31	33	(32)S
8	(31)JS	30	30	(29)JS	29	33	33	G	32	31	32	A	A	G	G	30	31	A	32	A	(35)S	5A	A	A
9	(31)A	(33)S	30	33	32	32	31	(29)JS	G	G	31	31	G	G	A	26	31	30	31	32	32	30	30	(31)A
10	29	29	30	30	31	30	32	28	30	27	32	A	G	29	26	28	31	31	30	32	33	31	31	(30)JA
11	A	A	31	31	A	34	34	A	A	32	34	29	(30)S	32	(32)JA	31	A	29	29	30	31	33	31	30
12	30	30	(33)PS	31F	(32)JS	34	G	G	28	A	A	A	28	28	A	27	M	29	31	32	31	30	(31)JS	31
13	32	A	28	(29)A	(30)JF	33	G	GA	G	G	G	G	G	GA	G	G	(27)JF	29H	31H	30	30	(31)JS	(29)S	(31)FS
14	AF	30F	(32)JF	(31)JF	(29)JF	(31)JS	(33)JS	32	31	30	30	(30)A	31	30	(27)A	30	30	31	30	32	32	30	30	30
15	30	29	30	30	30	31	32	28	30	29	28	30	A	30	26	29	28	30	30	31	33	32	A	A
16	30	30	30	29	(30)JF	32	A	A	A	A	A	A	26	A	29	28	32	31H	31	31	31	32	31	31
17	30	31	29F	31	31	34	34	31	34	(31)JA	31	30	30	28	29	(31)H	30	30	32	32	31	31	30	30
18	(30)S	32	30	29	31	33	G	G	27	31	29	30	29	28	28	29	30	30	33	32	31	31	30	30
19	A	31	30	(31)JA	31	32	33	G	31	31	31	31	26	30	G	28	30	31	31	33	30	A	A	A
20	(31)A	A	30	(34)S	30	33	31	G	A	32	30	A	G	27	30	28	30	A	(31)A	31	31	(30)S	30	30
21	A	(30)S	31F	A	32F	34	G	(35)JH	A	C	(33)A	31	A	(28)JH	A	29	30	30H	31	A	A	32	A	31
22	30F	31F	30F	(31)AS	S	(32)A	(34)JA	G	G	(32)H	(31)A	27	29	C	29	29	30	29	A	31	33	30	33	(34)S
23	29	30	30	31	30	31	34	G	G	G	G	23	G	G	G	24	27	26	26	28	28	29	30	29
24	28F	(29)JF	(27)JS	A	A	32	34	G	30	G	A	(26)H	(27)A	(27)P	28	27	31	32	32	33	32	30	31S	32
25	31	32	(32)PB	(33)PS	S	34	35	(30)PS	(26)H	26	(30)A	31	26	30	A	(30)JA	31	32	32	32	30	30	30	30
26	31F	29	(29)JS	31	S	(30)PS	(34)JS	G	G	G	G	G4	G	GA	G	G	G	(28)PS	30	32F	29	31	29	30
27	29	(28)JS	(29)JS	E	E	(31)PS	35	G	G	G	G	G	G	G	G	G	29	28	30	(31)JS	30	30	(30)JS	(30)JS
28	(27)JF	(28)JF	F S	E	E	(33)PF	35F	G	G	G	G	G	G	G	G	G	A	28	30	33	32	29	(30)JS	(28)S
29	(30)JS	(26)PF	(30)JF	(30)JS	S	S	G	G	G	G	G	G	G	G	G	G	27	31	33	31	30	(29)JS	30	(30)JS
30	31S	(29)PS	31	S	A	A	(34)JA	G	G	G	G	G	G	G	GA	30	29	28	32	31	33	29	(28)JS	29
31	30	31	(32)JS	(29)JS	(27)JS	31	(29)S	G	G	G	G	27	27	G	G	G	G	A	33	32	31F	(30)JF	29	30
Median	30	30	30	(31)	30	32	33	G	G	G	(28)	G	G	G	G	28	30	30	31	32	31	30	30	30
Count	27	28	30	26	21	29	30	28	25	26	28	26	27	28	25	30	26	26	30	29	30	29	27	28

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U.S. GOVERNMENT PRINTING OFFICE 1946 O - 703319

TABLE 71

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D. C.

Form adopted June 1946

IONOSPHERIC DATA

(M3000)F1, _____ July, 1953
(Characteristic) (Unit) (Month)

National Bureau of Standards
(Institution)

Observed at Washington, D.C.

Scaled by: Mc C., E. J. W.

Lat 38.7°N, Long 77.1°W

75° W Mean Time

Calculated by: Mc C, E. J. W.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							3.6	3.7	3.9	4.0	(4.0)H	4.0	3.9H	(3.9)H	4.0H	3.9	3.8	3.7	3.6	L				
2							H L	3.7	3.9	3.8H	4.0	4.0N	4.0	4.0	A	A	A	3.9	3.7	L				
3							3.7H	3.7	A	A	3.8	3.9	3.9	4.1	(3.9)A	3.9	3.8	?	A	L				
4							Q	A	A	A	(3.8)3 A	(3.9)3 3	3.9	3.8	3.9	3.8H	3.6H	3.8	3.8H	L				
5							3.6	3.7	(3.8)S	3.8H	(4.2)S	3.9	4.0H	(3.8)H	(4.0)H	3.9	A	3.6H	3.4	L				
6							3.8	3.8	4.0	4.0H	4.0	A N	3.9	4.0	3.9	3.8H	3.8H	A	3.8	L				
7						L	(3.7)D	3.8H	3.9H	A	A	3.9	A	A	A	A	A	A	A	L				
8							3.8	3.8	3.7	4.0	4.2	A	A	(3.9)H	3.9	3.9	A	A	A	A				
9							L	3.6	3.7H	3.9	4.0	A	4.2	4.1	A	3.9	3.6	3.9	3.5	A				
10							L	3.9H	4.0	4.0	A H	A	4.1	4.0	3.8	3.9	3.6	3.9	3.6	L				
11							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
12							3.5	3.6H	A	A	A	A	A	A	A	3.8	M	3.5	L	A				
13							3.5	A	3.9	3.8	3.8	4.0	A	A	4.0N	3.9	4.0	3.8	3.6	L				
14							Q	A	3.8	3.9	4.0	(4.1)A	4.1	3.8	3.9	3.7	3.6	3.5	3.5	L				
15							3.7	3.6	3.9	3.8	3.9	4.0	A	A	3.8	A	3.3	3.7	3.6	L				
16							A	A	A	A	A	A	4.0	A	4.0	A	A	3.7	A	L				
17						4.0	Q	A	A	A	4.0	4.1H	4.1	3.9	4.0	(3.7)A	3.6	3.7	3.5					
18							3.5	3.8	3.6	3.8	4.0	3.7	3.9	3.8	3.7	3.5	3.5	A	A					
19							A	4.1	3.8.	A S	A	A	4.0	3.8 h	3.9	3.9H	3.8H	3.6	3.9					
20							Q	3.7	A	A	S	A	4.0H	3.8	4.0H	A	A	A	A					
21							3.5	3.7H	A	C	3.7	A	A	3.7	3.6	3.7	4.0H	3.7	A					
22							A	3.6	(3.7)A	3.9	A	4.1	3.8	C	3.8	3.8	3.6	3.7	A					
23							Q	3.5H	3.8H	3.9	3.9H	3.8	4.0	3.9	3.8	3.8	3.8	3.5	3.3	L				
24							Q	3.8	3.5	3.5	A	4.0	3.7	3.9H	(4.1)H	(4.1)H	3.9	3.8	A					
25							Q	(3.8)H	3.9	3.9	(4.1)D	4.0	4.1H	3.9	A	A	3.7	3.8	A					
26							Q	3.8H	4.1	4.0	3.8	A	3.7H	A	3.9H	3.9	3.8H	3.6	3.5					
27							Q	3.9	3.9	4.0H	3.9H	4.1	4.0	4.1H	4.0	3.9H	3.7	3.7	L					
28							Q	3.7	3.8	3.9	4.0	4.0	3.9	3.8H	4.0	3.9	A	3.8	3.7					
29							3.5	3.8	3.8	3.7	3.8	A	3.9	3.9	3.9	3.8H	3.8	3.7H	3.6					
30							Q	3.9	3.7	3.9	4.0	4.1 "	4.1	3.8	A	A	A	3.6	3.6					
31							3.5	3.6	3.8	3.8	3.8	3.8	4.1	4.0	3.9	3.7 A	3.7H	A	A					
Median						—	3.6	3.7	3.8	3.9	4.0	4.0	4.0	3.9	3.9	3.9	3.8	3.7	3.6	—				
Count						1	13	25	23	21	22	19	24	23	24	23	21	23	17					

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 72

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D C

Form adopted June 1946

IONOSPHERIC DATA

(M1500)E , ____ July , 1953
(Characteristic) (Unit) (Month)

Observed at Washington, D. C.
Lat 38.7°N , Long 77.1°W

National Bureau of Standards
(Institution)

Scaled by: Mc C., E. J. W.

75° W Mean Time

Calculated by: Mc C., E. J. W.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							(4.1)H	(4.2)A	4.2	4.4	4.4	4.4H	(4.5)P	(4.4)H	4.5	4.5	4.1	4.2	4.4	S				
2							A	4.3	4.4	4.5	4.5	(4.5)HP	(4.5)P	(4.6)P	4.5	A	A	(4.4)H	(4.2)S	S				
3							(4.2)A	4.4	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.4	4.4	4.3	4.3	4.4				
4							4.4	4.4	4.3	4.3	4.3	A	A	4.4	4.2	4.2	4.1	4.0	4.2	(4.2)H				
5							4.0	4.3	4.3	4.3	A	A	4.3	A	4.3	4.1	4.2	4.3	4.2	A				
6							4.2H	4.3	4.3	4.3	4.4	4.3	4.3	4.4	4.3	4.3	4.3	4.4	4.4	S				
7							4.5	4.5	4.5	4.5	A	4.5	4.5	4.2	4.5	4.3	4.3	4.2	4.2	S				
8							4.2	4.2	4.2	4.3	4.3	A	A	4.4	3.9	A	A	A	A	A				
9							A	A	A	A	A	A	A	A	A	A	4.3	4.3	4.2	A				
10							A	4.3	4.3	4.3	4.2	A	A	A	A	A	4.2	4.2	4.4	(4.4)P				
11							A	A	A	A	A	4.3	A	A	4.4	4.0	4.1	4.3	4.3	A				
12							A	A	A	4.3	4.3	4.3	4.3	4.3	4.3	4.3	M	4.2	4.2	S				
13							A	4.3	4.4	A	A	4.4	4.4	4.3	4.2	4.3	4.4	4.3	4.2	A				
14							4.1	4.1	4.3	4.4	4.4	A	A	A	4.2	4.2	4.0	4.4	4.3	4.4				
15							(4.1)H	4.4	4.4	A	(4.3)A	A	B	A	4.2	4.3	4.4	4.3	A	A				
16							4.4	4.4	4.5	(4.4)A	A	A	A	A	4.3	4.4	4.4	4.5	4.3	A				
17						S	4.1	4.3	4.2	(4.3)A	A	A	A	A	A	A	A	A	A	A				
18							A	A	A	4.3	4.3	A	A	4.2	4.1	4.2	4.1	4.2	4.3					
19							A	4.3	A	4.3	A	A	A	4.3	4.1	4.2	4.1	4.3	4.2					
20							A	A	4.3	A	A	A	A	A	A	A	A	A	A					
21							4.1H	A	A	C	4.4	A	A	4.3	4.3	4.2	4.2	4.2	4.0					
22							A	A	A	A	4.3	A	A	C	4.3	4.2	4.3	4.3	A					
23							A	4.4	4.2	A	(4.5)A	A	A	4.3	4.4	A	A	A	(4.3)A	S				
24							A	4.3	A	A	4.4	4.5	A	A	(4.5)F	A	(4.3)P	4.3	(4.4)P					
25							S	4.5	4.3	4.4	A	(4.5)P	(4.6)F	A	B	4.4	(4.6)A	A	(4.4)P					
26							(4.1)S	(4.2)H	4.6	(4.5)A	(4.5)H	A	(4.4)B	(4.5)A	(4.2)P	A	(4.6)A	4.3	(4.5)F					
27							S	4.2	4.5	(4.5)P	B	(4.4)P	(4.3)P	(4.3)P	4.1	4.1	4.0	4.2	4.3					
28							A	4.3	4.3	4.2	4.3	4.2	A	A	A	4.3	A	4.2	4.1					
29							4.1	4.2	4.4	4.4	A	A	A	A	A	A	4.3	4.3N	4.3H					
30							A	A	4.4	4.4	4.3	(4.3)F	(4.2)P	A	A	A	4.5	A	A					
31							A	4.1	4.3	4.3	4.3	4.4	A	A	4.1	(4.3)P	4.1	4.1	4.2					
Median							4.1	4.3	4.3	4.3	4.3	4.4	4.4	4.3	4.3	4.3	4.3	4.3	4.3	—				
Count							14	23	23	22	19	14	13	15	23	20	24	25	25	4				

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

Table 73

Ionospheric Storminess at Washington, D. C.

July 1953

Day	Ionospheric character* 00-12 GCT	12-24 GCT	Principal storms Beginning GCT	End GCT	Geomagnetic character** 00-12 GCT	12-24 GCT
1	2	3	----	0200	5	4
2	2	3			4	4
3	1	3			3	3
4	2	3			3	3
5	2	3			3	2
6	1	2			3	2
7	1	2			3	3
8	3	3			3	3
9	3	3			2	3
10	2	2			3	1
11	2	2			2	1
12	1	1			1	3
13	2	3			4	3
14	1	2			2	4
15	1	2			4	3
16	2	1			2	1
17	1	1			2	1
18	1	1			2	1
19	2	1			2	2
20	1	1			3	2
21	2	2			2	1
22	2	1			1	2
23	1	3			4	4
24	2	1			3	3
25	2	1			2	3
26	2	3			4	3
27	3	3			5	3
28	3	3			5	3
29	2	3			4	4
30	2	3			4	4
31	1	3			4	3

*Ionosphere character figure (I-figure) for ionospheric storminess at Washington, D. C., during 12-hour period, on an arbitrary scale of 0 to 9, 9 representing the greatest disturbance.

**Average for 12 hours of Cheltenham, Maryland, geomagnetic K-figures on an arbitrary scale of 0 to 9, 9 representing the greatest disturbance.

----Dashes indicate continuing storm.

Table 74a

Radio Propagation Quality Figures
(Including Comparisons with Short-Term and Advance Forecasts)

June 1953

Day	North Atlantic 6-hourly quality figures				Short-term forecasts issued about one hour in advance of:				Whole day quality index	Advance forecasts (J-reports) for whole day; issued in advance by:			Geomagnetic K_{Ch}	
	00 to 06	06 to 12	12 to 18	18 to 24	00	06	12	18		1-4 days	4-7 days	8-25 days	Half day (1)	Half day (2)
1	7	6	7	6	5	5	6	6	7	6	6		2	2
2	6	(4)	6	5	6	(4)	(4)	5	5	(4)	(4)	X	(4)	(4)
3	(4)	(4)	6	6	(3)	(3)	(4)	5	5	(3)	(4)	X	(5)	3
4	5	5	6	6	(4)	(4)	6	5	6	(3)	(4)	X	(4)	3
5	6	5	6	6	5	(4)	5	5	6	(4)	(4)	X	3	3
6	6	5	7	7	(4)	(3)	6	5	6	5	5		3	3
7	5	6	7	7	5	5	6	5	6	6	6		3	2
8	7	6	7	7	5	5	6	6	7	6	6		2	2
9	8	6	7	7	6	5	6	6	7	6	6		1	2
10	7	6	7	7	6	6	6	7	7	6	6		3	3
11	7	6	7	7	6	5	6	6	7	5	5		2	2
12	7	6	7	7	5	5	5	6	7	(3)	(3)	X	2	(4)
13	6	5	6	6	(4)	(4)	5	6	6	(4)	(3)	X	3	3
14	6	5	7	7	5	5	6	7	6	(4)	(4)	X	3	3
15	7	7	7	7	6	5	6	7	7	(4)	(4)	X	1	2
16	7	7	7	7	7	6	6	7	7	(4)	(4)	X	1	2
17	7	6	6	7	7	6	6	6	7	7	6		2	3
18	7	6	7	7	6	6	6	6	7	7	6		2	2
19	7	7	7	7	7	6	7	7	7	7	6		2	2
20	7	7	7	7	7	6	7	7	7	7	7		2	(4)
21	7	7	7	7	5	6	7	7	7	7	6		3	3
22	7	7	7	6	5	5	6	7	7	6	6		3	3
23	7	6	7	7	6	6	6	7	7	5	5		1	2
24	7	6	7	7	7	7	7	7	7	7	5		2	2
25	7	6	7	7	7	6	7	7	7	7	6		2	2
26	7	7	7	7	7	7	7	7	7	7	7		0	2
27	7	7	7	7	7	7	7	7	7	7	7		1	2
28	7	7	7	7	7	7	7	7	7	6	6		2	2
29	7	6	6	6	7	7	5	6	7	(4)	(4)	X	3	(5)
30	5	(4)	5	6	5	(3)	(4)	5	5	(4)	(4)	X	(5)	3
Score:														
Quiet periods				P	13	9	10	17		10	4			
				S	9	15	17	11		9	15			
				U	5	3	1	2		3	3			
				F	2	0	2	0		8	8			
Disturbed periods				P	0	1	0	0		0	0			
				S	1	2	0	0		0	0			
				U	0	0	0	0		0	0			
				F	0	0	0	0		0	0			

Scales:
Q-scale of Radio Propagation Quality
(1) - useless
(2) - very poor
(3) - poor
(4) - poor to fair
5 - fair
6 - fair to good
7 - good
8 - very good
9 - excellent

K-scale of Geomagnetic Activity
0 to 9, 9 representing the greatest disturbance; $K_{Ch} \geq 4$ indicates significant disturbance, enclosed in ( ) for emphasis

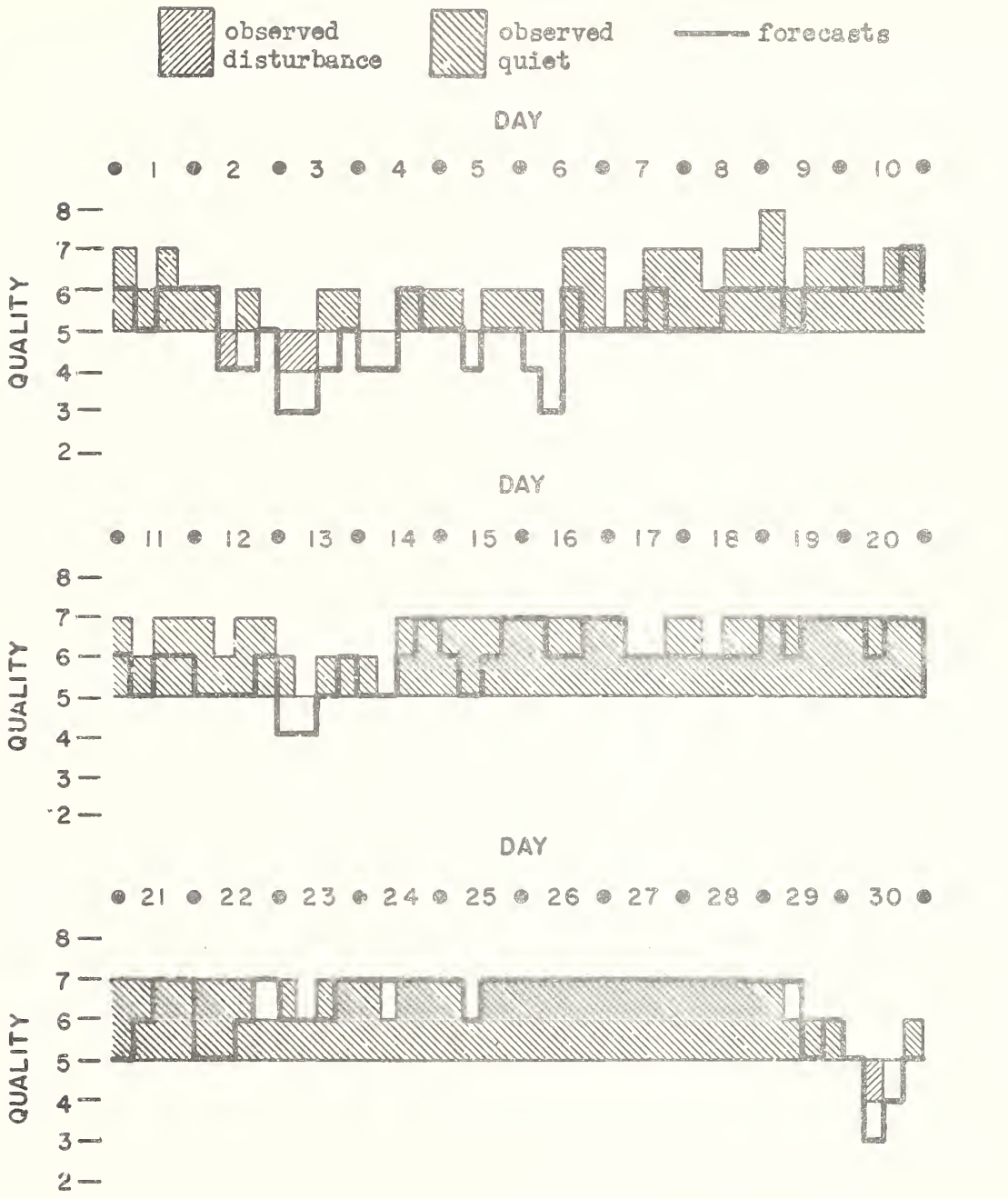
Scoring: (beginning October 1952)
P - Perfect: forecast quality equal to observed
S - Satisfactory: (beginning October 1952) forecast quality one grade different from observed
U - Unsatisfactory: forecast quality two or more grades different from observed when both forecast and observed were ≥ 5, or both ≤ 5
F - Failure: other times when forecast quality two or more grades different from observed

Symbols:
X - probable disturbed date

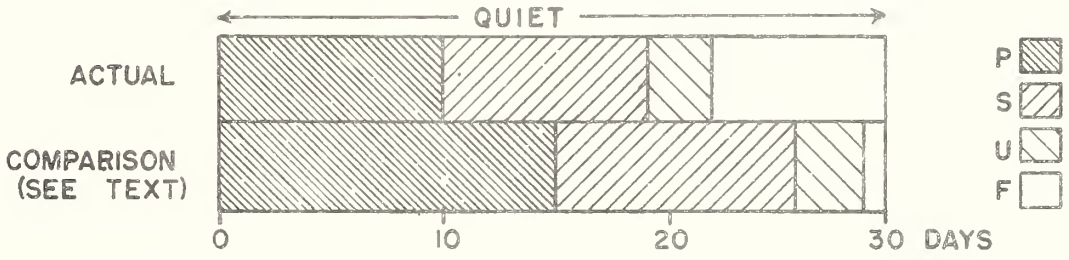
Note: All times are UT (Universal Time or GCT)

Table 74b

Short-Term Forecasts--June 1953



Outcome of Advance Forecasts (1 to 4 days ahead)--June 1953



Note: Five "failures" resulted because the eighth in a series of recurrent disturbances did not take place June 12-16. Thus June proved to be as undisturbed as a year ago rather than like May 1953.

Table 75a

Coronal observations at Climax, Colorado (5303A), east limb

Date GCT	Degrees north of the solar equator																			0°	Degrees south of the solar equator																		
	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5			5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1953																																						
July 1.6a	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.6a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6.7a	-	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.6	-	-	-	-	-	-	3	4	3	2	2	1	3	3	6	6	6	4	3	3	2	2	2	2	2	1	1	1	1	-	-	-	-	-	-	-	-	-
13.6	-	-	-	-	-	-	-	5	5	2	2	3	4	4	4	5	5	4	4	4	2	1	2	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-
14.6a	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	6	5	3	3	3	2	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
15.7	-	-	-	-	-	-	-	1	2	3	3	3	2	2	3	4	4	3	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19.8a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20.8a	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21.7a	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22.8a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
23.8	-	-	-	-	-	-	-	1	1	2	3	2	2	2	2	3	4	4	4	4	4	4	4	4	3	3	2	2	-	-	-	-	-	-	-	-	-	-
24.7a	-	-	-	-	-	-	-	-	1	2	2	2	2	3	4	4	4	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25.6a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	3	1	-	-	-	-	-	-	-
28.6a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2	2	2	3	3	1	-	-	-	-	-	-	-	-	-	-
29.6	x	x	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 76a

Coronal observations at Climax, Colorado (6374A), east limb

Date GCT	Degrees north of the solar equator																			0°	Degrees south of the solar equator																		
	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5			5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1953																																						
July 1.6a	2	2	2	2	1	1	1	2	2	1	1	1	1	2	2	2	2	2	2	2	4	2	3	3	2	2	2	2	2	2	2	-	-	-	-	-	-	-
2.7a	-	-	-	-	-	-	-	-	-	-	1	1	2	2	3	4	3	2	2	3	3	4	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.6a	2	2	2	-	-	-	-	-	-	-	1	1	2	3	3	4	5	4	3	3	4	3	3	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-
6.7a	2	2	-	-	-	-	-	-	-	-	-	-	-	2	2	3	3	3	3	3	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
7.7a	4	3	2	-	-	-	-	-	-	-	-	2	2	2	2	2	3	4	4	4	3	3	3	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
8.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.6	3	2	2	2	2	1	1	1	1	2	2	1	3	2	1	1	1	3	5	5	3	4	5	5	7	4	4	3	3	3	3	3	3	3	4	4		
13.6	3	3	3	3	-	-	-	-	-	-	2	4	3	2	3	3	4	3	3	3	3	3	3	4	3	3	2	2	3	2	2	2	2	3	3	3		
14.6a	2	2	1	1	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	2	2	2	2	2	2	2	2	2	2	2		
15.7	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	3	3	4	4	4	4	4	3	4	3	2	2	1	1	1	1	1	1	2	2		
19.8a	2	2	1	1	1	1	2	2	2	2	2	1	1	1	1	1	2	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
20.8a	2	1	-	-	-	-	-	-	-	-	1	1	1	1	2	2	2	2	2	2	3	3	4	5	4	2	2	2	1	2	1	1	1	1	1	2	2	
21.7a	2	2	-	-	-	-	-	-	2	2	2	-	-	-	-	-	-	3	3	4	3	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	3	
22.8a	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	2
23.8	2	1	1	-	-	-	-	-	-	2	2	3	3	3	3	3	3	4	4	4	4	4	3	2	-	-	-	-	-	-	-	-	1	1	2	2	2	
24.7a	2	2	2	2	2	2	2	1	1	1	1	1	1	1	2	2	3	3	5	3	3	4	2	2	2	1	1	1	1	1	1	1	1	1	1	1		
25.6a	3	3	3	1	1	1	1	1	1	1	1	2	2	3	3	3	4	4	4	5	4	3	3	3	3	5	4	4	4	2	2	2	2	2	2	2		
26.7a	2	2	2	1	1	-	-	-	-	1	1	1	1	2	2	3	4	4	4	3	3	3	2	3	3	2	2	2	1	1	1	1	1	1	2	2	2	
27.7	2	3	2	1	1	1	1	1	2	2	2	3	3	3	3	3	4	4	4	4	4	3	2	2	2	2	1	1	1	1	1	1	1	2	2	2		
28.6a	2	2	2	2	1	1	1	1	1	1	2	3	3	3	4	5	5	5	4	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	3	
29.6	x	x	x	x	3	3	3	2	2	2	2	2	2	4	3	3	3	3	4	6	3	3	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	

Table 77a

Coronal observations at Climax, Colorado (6702A), east limb

The 6702A coronal line was not visible on any of the observation dates in July (see Table 75a).

Table 75b

Coronal observations at Climax, Colorado (5303A), west limb

Date GCT	Degrees south of the solar equator 90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	0°	Degrees north of the solar equator 5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1953																																				
Jul 1.6a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	4	3	3	-	-	-	-	-	-	-	-	-	-	-	-
2.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	4	4	6	3	1	-	-	-	-	-	-	-	-	-	-	-	-
3.6a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	4	3	3	-	-	-	-	2	2	2	-	-	-	-
6.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	2	-	-	-	1	1	4	4	1	1	1	1	1	1	1	-	-	-	-	-
13.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-	-	-	-	-	-
14.6a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	-	-	-	-	-	-
19.8a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20.8a	-	-	-	-	-	-	-	-	-	2	2	2	2	3	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	4	4	3	3	2	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22.8a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	5	4	5	5	5	5	3	1	-	-	-	-	-	-	-	-	-	-	-	-
#23.8	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	3	3	5	5	6	6	5	2	2	2	2	1	-	-	-	-	-	-	-	-
24.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	3	5	6	6	5	3	2	1	1	1	1	1	1	-	-	-	-	-
25.6a	-	-	-	-	-	-	-	-	-	-	-	3	2	2	2	3	3	-	-	-	3	4	4	3	3	2	1	1	1	1	-	-	-	-	-	-	-
26.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	3	4	4	5	2	2	1	1	2	2	2	2	-	-	-	-	-	-
27.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	3	4	4	3	2	1	1	2	2	1	-	-	-	-	-	-
28.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	3	5	3	3	4	3	4	2	3	3	1	-	-	-	-
29.6	-	-	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

low weight from S90 - S20

Table 76b

Coronal observations at Climax, Colorado (6374A), west limb

Date GCT	Degrees south of the solar equator 90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	0°	Degrees north of the solar equator 5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1953																																				
Jul 1.6a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	4	2	2	2	2	-	-	-	-	-	-	-	-	2
2.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	3	2	2	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.6a	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	4	3	3	2	2	4	5	2	3	1	1	-	-	-	-	-	-	-	-	2
6.7a	-	-	-	-	-	-	-	-	-	-	-	2	3	2	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
7.7a	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	4	3	3	3	2	2	2	2	2	-	-	-	-	-	-	-	-	3	4
8.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.6	4	3	2	2	2	2	1	1	2	3	3	5	5	4	3	3	4	5	5	4	4	4	3	3	2	2	2	2	1	1	1	1	2	3	4	4	3
13.6	3	3	1	1	1	2	2	2	2	2	3	4	5	5	5	3	3	4	4	5	4	5	4	3	2	2	2	1	1	1	1	1	1	1	2	2	3
14.6a	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	3	3	3	2	2	2	2	3	2	2	2	2	1	1	1	1	1	1	2	2	2
15.7	2	2	2	2	2	2	2	2	2	2	3	2	2	3	3	4	4	4	4	4	4	2	2	2	3	2	1	1	1	1	1	1	1	1	1	2
19.8a	2	-	-	-	-	-	-	-	-	-	-	-	-	1	2	2	3	3	3	3	3	3	2	2	2	2	2	2	1	1	1	1	1	1	1	2
20.8a	2	2	2	1	1	1	1	1	1	1	2	2	3	2	3	3	4	4	4	4	3	3	2	1	1	1	1	1	1	1	1	1	2	2	2	2
21.7a	3	-	-	-	-	-	-	-	-	1	1	1	3	3	2	3	5	5	4	3	3	3	2	1	-	-	-	-	-	-	-	-	-	-	2	2
22.8a	2	2	2	2	2	1	1	1	1	1	1	2	2	3	5	3	6	5	5	5	5	3	3	1	1	1	1	1	1	1	1	1	2	2	2	2
23.8	2	3	3	3	2	1	1	1	1	3	3	4	5	3	3	3	6	5	4	4	6	2	1	-	-	-	-	-	-	-	-	-	-	2	2	2
24.7a	1	2	2	1	1	1	2	3	3	2	2	2	4	3	3	4	4	3	3	2	2	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2
25.6a	2	2	2	2	1	1	1	1	1	1	1	2	2	2	2	3	3	3	4	3	3	3	4	2	2	2	2	2	2	2	2	2	2	2	2	3
26.7	2	2	2	2	1	1	1	1	1	2	2	2	2	3	3	2	2	2	3	4	4	3	2	2	2	2	2	3	2	1	1	1	1	2	2	2	2
27.7a	2	1	1	1	1	1	1	1	1	2	3	2	2	3	5	3	2	2	2	2	2	2	3	3	1	1	1	1	1	1	1	1	1	1	1	2
28.6	3	2	2	2	2	2	2	2	2	2	2	2	2	4	3	3	3	3	2	2	2	2	3	3	2	2	2	1	1	1	1	1	1	2	2	2
29.6	1	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 77b

Coronal observations at Climax, Colorado (6702A), west limb

The 6702A coronal line was not visible on any of the observation dates in July (see Table 75b).

Table 78a

Coronal observations at Sacramento Peak, New Mexico (5303A), east limb

Date GCT	Degrees north of the solar equator 90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	00	Degrees south of the solar equator 5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1953																																				
July 5.6a	-	-	-	-	3	3	3	2	3	3	3	3	2	2	2	3	3	3	2	2	2	2	2	2	2	2	2	-	-	-	-	-	2	-	-	-	-
9.7	-	-	-	-	-	2	3	4	4	3	5	3	2	2	3	3	5	11	10	5	4	4	4	4	3	3	3	2	-	-	-	-	-	-	-	2	2	-
10.7	-	-	-	-	-	-	-	-	3	3	2	2	3	3	4	4	5	11	18	20	6	3	3	2	-	-	2	2	2	-	-	-	-	-	-	-	-	-
11.7a	-	-	-	-	-	-	3	3	2	3	3	3	4	4	4	5	10	8	6	3	3	3	2	2	3	3	3	2	3	3	-	-	-	-	-	-	-	-
12.7a	-	-	-	2	3	3	3	3	x	x	x	x	x	x	4	3	4	4	4	5	x	x	3	3	4	4	3	3	4	3	3	3	3	3	-	-	x
15.7a	-	-	-	-	-	3	3	3	3	2	2	2	3	3	3	3	4	4	3	3	3	4	3	2	2	2	2	-	-	-	-	-	-	-	-	-	-
16.9a	-	-	-	-	-	-	-	-	2	2	2	2	3	3	2	2	3	3	2	2	3	2	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-
18.9	-	-	-	2	2	3	3	3	3	3	2	2	2	3	3	3	3	3	2	2	3	3	3	3	2	3	3	4	3	3	2	2	2	4	3	2	2	-
20.7	-	-	-	-	2	3	3	2	2	3	2	2	2	2	2	2	3	3	3	3	2	2	2	2	2	-	2	2	2	2	-	-	-	-	-	-	-	-
21.6a	-	-	-	-	-	3	3	3	3	2	2	3	2	2	2	2	3	2	2	2	2	3	3	3	2	-	2	3	3	3	3	2	-	-	-	-	-
23.9a	-	-	-	-	-	-	-	2	2	2	3	3	3	2	3	3	3	3	3	2	3	3	2	2	x	x	x	x	x	x	x	x	x	x	x	x	x	x
24.7a	-	-	-	-	-	-	-	-	2	2	2	2	2	3	3	4	5	4	3	2	3	3	2	2	2	2	2	3	2	2	-	-	-	-	-	-	-	-
26.6a	-	-	-	-	-	2	2	2	2	-	2	3	3	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-
27.7a	-	-	-	3	3	2	-	2	3	4	3	2	2	3	3	2	2	-	-	2	3	3	2	2	3	-	-	-	-	2	2	3	3	3	2	2	2
28.6a	-	-	3	3	3	3	3	2	2	2	2	3	3	3	2	2	2	2	2	2	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3

Table 79a

Coronal observations at Sacramento Peak, New Mexico (6374A), east limb

Date GCT	Degrees north of the solar equator 90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	00	Degrees south of the solar equator 5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1953																																				
July 5.3a	-	3	2	2	2	2	3	2	-	2	3	2	2	3	3	3	4	5	5	4	3	4	4	5	7	3	2	2	2	2	2	-	-	-	-	-	-
9.7	2	3	3	-	-	-	-	2	2	2	2	-	-	2	2	3	3	10	5	7	6	5	4	4	5	5	3	3	2	-	-	-	-	-	-	2	2
10.7	3	2	2	2	-	-	-	-	-	2	2	2	2	-	2	3	3	13	3	4	5	6	6	7	8	4	3	2	-	-	-	-	2	2	2	2	2
11.7a	-	2	2	2	2	2	2	3	2	3	2	2	2	2	-	2	-	2	3	2	3	2	3	3	5	3	2	-	2	-	-	-	2	2	2	2	2
12.7a	3	3	2	-	2	-	-	-	x	x	x	x	x	x	2	3	3	3	4	5	x	x	3	4	5	4	3	3	4	-	-	-	-	-	-	-	x
15.7a	3	2	3	3	3	-	-	2	2	3	2	2	2	3	-	2	3	2	2	3	2	3	3	3	3	2	3	-	-	2	-	-	-	-	-	-	2
16.9a	2	2	-	-	-	-	-	-	-	2	3	2	2	3	3	3	2	2	3	3	4	4	5	4	3	4	2	2	2	-	2	3	2	-	-	-	2
18.9	4	4	4	3	3	-	-	2	2	2	5	4	4	4	3	4	5	5	4	6	5	5	6	6	5	5	3	-	-	-	-	-	3	3	2	2	2
20.7	3	3	3	2	3	2	2	2	3	3	3	4	3	2	3	3	3	5	4	5	6	4	4	3	4	5	3	2	2	-	-	2	2	2	2	2	2
21.6a	3	2	3	3	2	3	2	2	2	3	4	3	2	3	3	4	4	3	3	4	4	4	5	3	3	2	2	3	2	2	2	-	-	-	2	2	2
23.9a	2	2	2	2	3	2	-	-	-	2	2	3	3	4	4	4	3	2	3	3	3	4	3	2	x	x	x	x	x	x	x	x	x	x	x	x	x
24.7a	2	2	3	2	2	2	2	-	2	3	3	3	3	3	3	3	2	3	4	4	2	3	3	2	3	2	-	-	2	-	2	-	2	-	-	-	2
26.6a	2	-	3	3	2	2	3	2	-	2	2	-	2	4	4	5	4	3	3	3	2	3	3	4	4	3	3	2	3	-	-	-	2	2				
27.7a	-	-	-	-	-	3	2	-	-	-	2	3	3	2	3	3	2	2	2	3	2	2	3	2	2	2	-	-	-	-	-	-	-	-	-	-	-
28.6a	-	2	2	-	2	2	3	3	2	2	-	2	2	5	4	5	4	5	3	4	3	4	3	3	2	3	2	2	2	3	2	2	2	3	2		

Table 80a

Coronal observations at Sacramento Peak, New Mexico (6702A), east limb

Date GCT	Degrees north of the solar equator 90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	00	Degrees south of the solar equator 5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1953																																				
July 5.6a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	4	2	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	3	4	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.7a	-	-	-	-	-	-	-	-	x	x	x	x	x	x	-	-	-	-	-	-	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-	x
15.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16.9a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21.6a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23.9a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	x	x	x	x	x	x	x	x	x	x	x
24.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	3	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26.6a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28.6a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 78b

Coronal observations at Sacramento Peak, New Mexico (5303A), west limb

Date GCT	Degrees south of the solar equator 90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	0°	Degrees north of the solar equator 5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1953																																				
July 5.6a	-	-	-	-	-	2	2	2	2	2	2	2	3	3	2	3	3	3	4	2	2	2	3	3	3	2	2	3	3	2	3	3	2	2	2	-	-
9.7a	-	-	-	-	-	-	-	-	2	2	3	3	3	2	2	4	5	4	3	2	2	3	2	3	2	2	2	3	2	2	2	2	-	-	-	-	-
10.7	-	-	-	-	-	-	-	3	3	3	2	2	2	2	2	3	3	2	2	2	2	3	5	8	4	4	4	3	2	2	3	2	2	-	-	-	-
11.7a	-	-	-	-	2	3	4	3	3	2	2	2	2	2	2	3	3	2	2	-	2	3	6	5	4	3	3	4	2	2	2	-	-	-	-	-	-
12.7a	x	x	x	-	-	-	-	-	-	-	-	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	3	3	2	2	-	-	-	-
15.7a	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	3	3	2	2	-	-	-	-	-	-	-	-	-	-	3	3	3	2	2	-	-	-
16.9a	-	-	-	-	-	-	2	2	2	3	3	2	3	3	3	3	3	4	3	3	2	2	3	3	3	3	3	3	-	-	-	3	3	-	-	-	-
18.9	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	3	3	3	3	2	3	3	3	3	3	3	3	2	2	2	3	2	2	-	-	-	-
20.7	-	-	-	-	-	-	-	-	3	3	2	-	-	2	2	3	5	2	3	4	3	2	3	3	2	2	2	2	2	2	3	3	2	2	-	-	-
21.6a	-	-	-	-	-	-	3	2	3	3	2	2	2	-	2	4	5	4	3	2	2	2	2	3	3	3	3	2	2	2	3	2	2	-	-	-	-
23.9a	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	2	3	3	2	2	2	-	-	-
24.7	-	-	-	-	2	3	2	2	2	2	2	2	-	-	2	3	3	3	4	5	11	13	16	11	5	3	2	2	3	3	3	3	2	2	2	-	-
26.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	4	7	6	6	5	4	3	2	2	3	3	4	3	2	-	-	-	-
27.7a	2	-	-	-	-	-	-	2	2	2	3	3	2	3	3	3	2	2	3	3	2	2	2	4	4	3	3	2	3	3	3	3	3	2	2	-	-
28.6a	3	2	2	2	2	3	2	2	3	3	2	3	3	3	3	2	2	3	3	3	3	2	4	4	3	2	3	3	3	3	4	3	2	2	-	-	-

Table 79b

Coronal observations at Sacramento Peak, New Mexico (6374A), west limb

Date GCT	Degrees south of the solar equator 90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	0°	Degrees north of the solar equator 5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1953																																				
July 5.6a	-	-	2	2	2	2	2	-	2	2	2	3	2	3	3	3	4	3	3	3	4	4	2	3	2	3	3	3	2	3	3	3	3	2	3	-	-
9.7a	2	2	2	2	3	-	2	2	2	2	2	3	2	3	3	3	3	4	5	4	2	3	3	3	3	2	3	3	2	3	2	3	-	2	2	2	2
10.7	2	-	2	2	3	2	2	-	3	2	2	3	3	4	3	3	3	3	4	3	3	2	-	3	2	3	2	2	3	-	2	2	-	2	3	3	3
11.7a	2	3	3	-	-	-	2	2	2	3	2	3	2	3	3	4	4	4	5	5	2	3	3	4	3	3	2	2	2	2	-	-	-	2	3	2	-
12.7a	x	x	x	-	-	-	-	-	-	-	-	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	2	2	-	-	2	-	2	3
15.7a	2	2	2	-	2	2	-	-	-	-	2	3	2	3	3	4	4	4	4	4	4	4	3	4	5	4	3	2	-	2	-	2	-	2	2	2	3
16.9a	2	-	-	-	2	-	-	-	-	-	2	2	-	2	3	2	-	2	3	2	-	3	3	3	-	-	3	2	2	-	2	2	2	-	-	2	2
18.9	2	-	-	3	3	-	-	2	2	3	3	4	5	6	6	7	7	6	8	9	7	5	4	5	5	6	5	4	3	2	3	2	2	2	3	3	4
20.7	2	2	2	-	2	2	-	-	2	2	2	2	3	4	5	6	8	7	7	11	10	8	5	4	3	3	-	-	-	2	2	2	3	3	2	2	3
21.6a	2	2	2	3	3	2	2	-	-	2	2	3	4	4	5	8	7	11	10	8	7	7	4	2	2	4	3	-	-	2	-	-	2	2	2	3	3
23.9a	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	3	2	2	2	2	2	-	2	2
24.7	2	2	2	2	2	2	-	-	2	-	-	2	2	3	4	4	5	4	4	4	4	2	2	2	-	-	-	2	3	2	-	2	2	2	2	2	2
26.6	2	2	2	2	-	-	-	-	-	-	2	2	3	3	3	3	2	3	2	3	3	3	2	2	3	3	2	2	2	-	2	2	-	2	-	2	2
27.7a	-	-	-	3	-	-	-	-	-	-	2	2	2	3	2	2	-	-	-	2	3	3	3	3	2	-	2	2	-	-	-	-	-	-	-	-	-
28.6a	2	3	2	3	3	2	2	-	-	2	2	2	3	3	2	2	2	3	3	-	-	2	2	3	3	2	2	3	-	-	2	2	2	2	2	-	-

Table 80b

Coronal observations at Sacramento Peak, New Mexico (6702A), west limb

Date GCT	Degrees south of the solar equator 90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	0°	Degrees north of the solar equator 5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1953																																				
July 5.6a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.7a	x	x	x	-	-	-	-	-	-	-	-	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	-	-	-	-	-	-	-	-
15.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16.9a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21.6a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23.9a	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	-	-	-	-	-	-	-	-	-
24.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	3	2	-	-	-	-	-	-	-	-	-	-	-	-
26.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28.6a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 81

Zürich Provisional Relative Sunspot Numbers

July 1943

Date	R_Z*	Date	R_Z*
1	0	17	16
2	7	18	21
3	0	19	11
4	0	20	8
5	0	21	14
6	7	22	0
7	7	23	0
8	0	24	0
9	9	25	0
10	20	26	0
11	22	27	0
12	16	28	0
13	23	29	0
14	24	30	0
15	40	31	0
16	19	Mean:	8.5

*Dependent on observations at Zürich Observatory and its stations at Locarno and Arosa.

Table 82

American Relative Sunspot Numbers

June 1953

Date	$R_{A'}$*	Date	$R_{A'}$*
1	14	17	21
2	26	18	18
3	24	19	26
4	35	20	29
5	34	21	18
6	34	22	17
7	32	23	13
8	34	24	12
9	30	25	17
10	28	26	13
11	17	27	5
12	7	28	4
13	3	29	7
14	18	30	6
15	21		
16	25	Mean:	19.6

*Combination of reports from 28 observers; see page 10.

Table 83

Solar Flares, July 1953

Observatory	Date 1953	Time Observed Beginning (GCT)	Time Observed Ending (GCT)	Duration (Min)	Area (Mill) (of) (Visible) (Hemisph)	Position Latitude (Deg)	Position Longitude Diff (Deg)	Time of Maximum (GCT)	Int. of Maximum	Relative Area of Maximum (Tenths)	Importance	SID Observed
Sac. Peak	July 15	1900	2015	75	135	S09	W02	1920	13	2	1	
McMath	15	1923F	1945L	-		S08	W02	-			1+	
Sac. Peak	16	2155	2225	30	23	S08	W19	2209	8	1	1-	

Sac. Peak = Sacramento Peak

F Time of first observation
L Time of last observation

Table 84

Indices of Geomagnetic Activity for June 1953

Preliminary values of international character-figures, C;
Geomagnetic planetary three-hour-range indices, Kp;
Magnetically selected quiet and disturbed days

Gr. Day 1953	C	Values Kp three-hour interval 1 2 3 4	5 6 7 8	Sum	Final Selected Days
1	0.1	2- 2- 2- 1-	1- 1o 2- 1+	10+	Five
2	1.5	3- 4+ 6o 6-	5o 5o 6- 5-	39o	Quiet
3	1.4	5- 4+ 6o 3o	4+ 4- 4o 3o	33o	
4	1.0	4+ 5- 5- 4o	3+ 3o 2+ 2o	28+	16
5	1.0	2- 3+ 4o 3o	1+ 2+ 6- 2+	24-	19
					23
6	0.7	3o 4- 3o 3-	2+ 3o 2+ 1+	21+	26
7	0.4	2+ 2- 3+ 2o	2- 2- 1+ 2-	16-	27
8	0.1	2- 2- 2- 1o	1+ 2- 1o 1o	11o	
9	0.1	1- 1+ 2o 2-	1+ 1o 1+ 1o	10+	
10	0.6	1+ 3o 4- 2+	2o 2o 3+ 2+	20o	
11	0.5	2o 2o 2+ 2o	2o 1+ 1+ 3+	16+	Five
12	0.9	1- 1+ 1+ 2+	2+ 3+ 4+ 4o	20-	Disturbed
13	0.8	4- 3+ 2+ 2o	2+ 2o 3+ 3-	22-	
14	0.5	2+ 2o 2o 1o	2o 2o 3- 2o	16o	2
15	0.2	1- 1+ 1+ 0+	2- 1- 2+ 2o	10+	3
					4
16	0.2	0+ 0+ 1o 2-	2- 1- 1o 1+	8o	29
17	0.5	2o 1+ 2o 1+	3+ 3o 1+ 2+	17o	30
18	0.2	2o 2o 2o 1-	1- 0+ 2- 2o	11+	
19	0.2	1o 1o 2- 0+	1+ 1+ 1- 1+	9-	
20	0.8	1o 2- 2- 3o	4- 3o 5- 4-	22+	
21	0.7	2o 3o 4- 3o	2- 2o 3o 3o	21+	Ten
22	0.8	1+ 2- 2+ 3-	3o 2o 2o 2+	17+	Quiet
23	0.0	1+ 1- 1- 0+	1- 0+ 0+ 2o	6+	
24	0.4	2o 2o 1+ 1-	1- 1+ 3o 2+	13+	1
25	0.1	2+ 1+ 1o 1o	1o 1o 1+ 1+	10+	8
					9
26	0.0	0o 0o 0+ 0+	0+ 1o 1+ 1o	4+	16
27	0.2	0+ 1- 1- 1+	1- 1+ 1+ 2-	8o	19
28	0.2	1- 2- 0+ 1-	1- 0+ 1+ 2+	8o	23
29	1.5	2- 1o 3+ 6-	6+ 6- 5- 5-	33o	25
30	1.4	6- 4+ 5o 5+	4- 4- 4- 3+	35-	26
					27
Mean	0.57				28

Table 85. Geomagnetic planetary three-hour-range indices Kp.

January 1937										February 1937										March 1937									
E	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum
1	1o	0+	0+	0+	1-	0+	0+	0o	3+	3o	3-	3-	2+	2-	1+	1o	0+	15o	3o	2-	3o	4-	3-	2+	4o	6-	26o
2	0o	1-	0+	2o	1o	0+	2+	4o	11-	0o	0+	1+	1+	1o	1o	1-	4o	10-	4+	4o	5-	3-	3+	4-	4-	2o	28+
3	3-	4-	1+	2o	2-	1-	0o	1-	13-	6+	6o	6-	4o	3o	5-	7-	3+	40-	2o	1-	0+	0+	0+	0o	0+	0o	4o
4	2o	3o	2+	2o	1o	1+	2-	1-	14o	3o	2+	2o	3+	3+	2+	3+	3-	22+	0+	1-	1+	1-	3o	1-	0+	2-	9-
5	0+	2-	2-	0+	0+	1o	1+	0+	7o	3+	4-	4-	2-	2+	3-	4-	4o	25o	2o	4-	4o	6-	5+	4+	3+	4+	33-
6	1+	2-	1o	1-	1o	0+	0+	1-	7o	3-	4-	2o	4-	3-	2+	3o	3o	23o	4-	2o	1o	1+	1+	0o	1-	1+	11+
7	1+	1+	2-	1+	2-	3o	6-	4+	20+	2+	3-	3-	2+	2+	1+	1+	2o	17o	0o	0+	0+	0+	1-	1-	1o	0+	4-
8	4-	1+	1-	1-	0+	0+	1o	1o	9o	0+	1-	2-	1o	1-	1o	1+	2+	9o	0o	0+	1-	1-	0o	0o	1o	1-	3+
9	1+	2+	3o	4o	3o	2+	4-	4+	24o	3+	2o	3-	3-	4o	4o	4+	4+	27+	3-	3o	1o	1+	1+	1+	2-	2-	14o
10	3+	3-	3o	4-	4o	3o	3-	4+	27+	3o	3o	3-	2+	4o	2+	3-	3o	23o	2-	1+	1o	1+	2-	2-	1o	1o	11-
11	3-	3o	3o	2o	2o	2+	2o	4o	21o	3o	3+	3+	2-	3-	2+	3o	2o	21+	1o	1-	0+	1-	0+	1o	1+	1+	7-
12	2+	2o	2o	2-	3-	3+	2+	2+	19-	2o	1+	2+	2o	2o	3c	3o	4o	20-	0o	0o	0+	0+	0o	0o	0+	1o	1o
13	4-	3+	3-	2o	2o	1-	2-	2-	18-	1o	1+	3o	3-	4o	3o	3o	4-	22-	0o	1+	1o	0+	1-	2-	2-	5o	12-
14	2-	1-	2-	2o	1-	0+	1-	1+	9o	3+	2+	2-	1+	0+	2o	3+	4o	18+	5o	5o	3-	3o	1+	3o	2o	2-	24-
15	0+	0o	0+	1-	1-	0+	0o	0+	3-	4-	2o	2o	2o	2+	2o	3o	2+	19+	3o	3o	4o	5-	6-	3+	2-	1+	27-
16	1+	1o	1o	1o	1-	0+	0o	0o	5+	4-	2+	2+	3o	3-	3o	1+	2o	20+	2+	1-	1o	0+	1-	2-	2+	2o	11o
17	0+	0+	1-	2o	1o	0+	1o	2-	7+	1+	2o	2-	3-	3+	3-	2+	2+	18+	3o	3-	2o	2o	1o	1o	2o	3o	17-
18	1o	1o	1-	0+	1-	1-	0+	1-	5+	3-	2+	1o	2-	2+	1+	4-	4o	19o	1+	2-	2+	1+	1-	1+	1-	2+	12-
19	0+	0o	0o	1-	1-	1-	1+	5-	4+	3o	4-	4-	4+	5+	4o	3o	31+	2-	1-	1+	1-	0+	0+	1o	1+	7+	
20	1-	0c	0o	0+	2-	3-	3o	2-	10o	2+	3o	2o	3o	3-	3+	3-	2-	21-	1+	2o	1-	1-	1-	1-	2-	8+	
21	2+	2o	2-	3-	3+	3+	4-	4o	23o	1+	4-	2o	2-	3-	2+	4-	3-	20o	0o	1-	0+	1-	2+	2o	3-	9+	
22	2+	1o	1+	1o	1+	0+	1o	0+	9-	1o	1+	3-	3o	3+	3-	1+	2-	17o	3o	3+	3-	4o	4+	3+	3+	4o	28o
23	1-	1-	1-	0+	1-	0+	1o	0+	5-	2o	1o	1o	0+	1o	1-	1-	1+	8o	3+	4-	2o	2o	3+	2-	1+	0+	18-
24	0o	0+	1-	1-	1o	0o	0o	1-	3+	1o	2o	4-	3-	2-	1o	1-	1+	14o	2o	2-	2-	1+	1+	2-	3-	3o	15+
25	0+	0+	1-	1-	1o	0o	0o	0o	3o	2+	3-	3-	3-	1+	1o	1o	0+	14o	1+	0+	2+	3+	1+	1-	1o	1o	11+
26	0o	0o	2-	1+	0+	0+	0+	0+	4+	0+	2o	2+	2+	2+	1o	0+	0+	11o	1o	0+	2-	2-	2+	1+	3+	4o	16-
27	0+	1o	4-	4o	4o	2+	3o	2+	21-	3-	3+	1+	2+	2o	1+	1+	1-	15o	4+	4+	3+	4o	5o	4+	4-	4-	33-
28	3-	3+	2+	2+	3-	2o	3o	3-	21o	2o	1c	2o	2o	2+	2o	2o	2-	15o	5-	5-	4+	3o	2+	2-	2-	3o	25+
29	3+	3o	2+	2-	2-	0+	1-	1o	14o										3-	3-	2-	1-	1o	0o	1-	2+	12-
30	0+	1-	2-	2o	3-	4+	3-	2o	16+										2o	3-	2-	1-	2o	2o	4o	1+	16+
31	1-	0+	1o	2-	1o	1-	0+	0o	6-										2+	5+	7+	5+	4-	5-	5-	5o	38+

April 1937										May 1937										June 1937									
E	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum		1	2	3	4	5	6	7	8	Sum
1	3-	1+	1+	1+	2-	1+	2+	3-	15-	4+	5-	3o	3o	2+	2o	3o	3-	25o		3o	3+	3-	2+	2o	1+	3-	1-	18o
2	3o	4-	3o	4+	2o	3+	5o	4-	28o	2+	2+	2-	0+	1o	2-	2-	2o	13o		2o	2-	1+	2o	2o	2+	1+	2o	15-
3	4-	5o	4o	4-	4-	3o	4-	4-	30+	1+	2-	2+	1+	0+	3o	3-	3-	15+		3+	1o	2-	1+	1o	1o	1-	1o	11o
3	3-	2o	2+	2o	2+	1o	2+	2o	17-	3-	3o	1+	1+	1-	3o	5-	3-	21+		1o	1o	1o	1o	1+	3o	3-	2+	2+	15-
5	1+	2o	1-	1o	1+	2-	1-	0+	9+	7-	6+	7o	5+	5o	6-	1+	1+	39-		3-	3-	2+	3-	3o	3-	4+	5+	26-
6	1+	2-	1+	1+	2o	1o	0+	1-	10-	2-	2-	0-	0o	1-	0-	0+	0+	5-		5+	5o	6-	5o	5-	5o	3-	3+	37o
7	1-	1-	1o	1+	1-	2+	1+	2o	10-	1-	1+	0-	1o	1+	1+	1+	1-	7+		3o	1+	2-	2+	3-	3-	2+	5-	19-
8	1-	1o	0+	1-	1-	0+	0o	1-	4+	1-	0-	1o	1-	1+	1-	1o	2+	7o		2o	2-	2-	2-	1+	1+	2o	3+	15o
9	1+	0+	0+	0o	0+	0o	0-	0o	2+	2-	2o	2-	3o	4-	3o	3-	4o	23-		3-	1+	1o	2-	1+	1-	1-	1-	10o
10	0o	0-	0+	0+	0+	0+	1+	3o	3+	3+	2o	2-	5-	1+	3-	3-	20-		0+	4o	3+	2o	1o	1o	1o	2+	15o	
11	4-	3+	2o	1+	1-	2o	2-	0+	15o	4o	4-	2o	2+	2o	3-	1o	0+	18o		2+	2-	2o	1+	2o	1o	1-	0+	11+
12	0+	1-	2+	2o	4+	4+	5-	4o	23-	1+	3-	1+	1-	1o	1o	1o	1o	10o		0+	0+	0-	0o	1-	1-	2-	1o	5+
13	4-	1-	3-	2o	2-	1+	2+	2+	17-	0+	2-	3-	1-	1+	2o	1o	2-	11+		1o	3-	3o	4+	5o	4-	3-	2-	24o
14	0+	2o	1+	0+	0+	1o	1+	1+	7-	1-	2-	3-	2+	3-	3+	3o	2+	19-		3-	3o	4-	1o	2o	1+	2-	3-	18o
15	0+	1o	1o	1-	1+	2o	2o	1-	9o	3o	3o	2+	1o	2+	2+	2-	2o	18-		2+	2-	3+	2-	2o	1-	1o	2o	15-
16	0+	0+	1-	2+	1+	1o	1-	1o	8-	4o	2o	2+	1+	2+	2+	2+	3-	19+		4-	3+	2o	1+	2o	3-	3o	3-	21-
17	1o	2-	1+	1o	1o	1+	3o	2o	12+	2-	1+	1+	1o	1o	2-	1+	1-	10o		4o	3o	3+	3o	3o	2o	3o	2+	24-
18	4o	3o	2o	3-	2+	2-	2-	3-	20o	0o	1o	2-	1o	1o	2-	2-	2-	10-		3-	2o	3o	2o	3-	3-	2+	2o	19+
19	2o	2+	2-	2-	2o	2o	3+	4-	19-	1o	2+	3+	3-	2+	2+	1o	0+	14+		2-	2o	1+	1o	0+	1o	2-	1+	10+
20	3o	3o	2+	2o	2o	1+	1+	1o	16o	0o	0+	1o	1+	1o	0+	1-	1-	5+		3+	4+	4+	2o	3+	3o	5o	4o	29+
21	4o	4-	3+	3-	2o	2-	1o	1o	19+	0o	0+	1-	1-	1+	4o	3-	2-	11+		4-	3+	2-	1-	0+	2-	3o	2+	17-
22	1-	0+	2-	0+	1+	1+	1o	2o	9-	0o	0+	1-	3o	2-	2-	2-	1-	10-		3-	1+	2-	4+	4o	3+	4-	3+	24+
23	1+	1	1	0o	1+	1+	3o	2-	11o	1o	2o	3-	1o	2-	2-	2o	1+	13+		2+	2-	1+	1o	2+	1+	1-	1+	12o
24	2-	2+	2o	3-	4o	5-	5+	8o	31-	1o	0+	1-	1-	1o	1o	3-	2+	10-		2o	2+	3+	2o	4-	4o	4-	2+	23+
25	7o	4-	4-	2-	1o	6o	7+	7+	38-	3c	4o	3-	3+	2+	3-	3+	4-	25o		3o	3-	2o	3-	2+	2+	2-	2+	20-
26	6-	5-	3+	2+	2o	5o	7-	8+	38o	4o	5-	4-	2-	2-	2o	3o	2+	23o		2o	1+	1+	1+	0+	0+	0+	0o	7c
27	7o	6o	4o	2+	2o	2-	6+	7o	36+	2+	2o	3-	3o	4o	3-	5o	5+	28-		2+	3+	3-	4o	4+	5+	5+	5-	32o
28	7o	1o	0-	7+	7-	7-	5o	5+	54o	5-	5+	4o	5-	6-	5-	6-	6-	40+		3o	3o	3+	4-	2+	2+	2-	2+	22-
29	2+	2o	4-	3+	4-	4-	4o	4-	26+	5+	5-	4+	4+	2-	2+	3o	4-	29+		3+	2+	2-	2-	2o	2-	1-	2o	15+
30	3+	4o	3+	4o	3+	3o	4-	4-	28+	3-	3o	2+	2o	2+	2o	2+	3-	19+		2-	2o	2-	1-	1o	0+	3-	2-	12-
31										4-	3+	1o	1-	0+	1+	2+	3o	16-										

Table 85 (continued). Geomagnetic planetary three-hour-range indices Kp.

July 1937										August 1937										September 1937									
D	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum
1	3o	2o	2+	2-	3+	1+	3-	2o	18+	2+	2o	2-	2-	2+	2+	3o		17o	1+	1+	2o	2-	3o	4-	2+	3+	19-
2	2-	2o	1+	1-	1-	2o	2+	2o	13-	4o	6o	6+	5o	6-	5-	3+	3o	38o	2+	1o	1-	1-	1-	0+	0+	0o	6o
3	1+	2-	3-	1+	1-	0o	0o	1+	9o	2o	2+	3o	2+	3o	2o	3-	5+	23-	1o	1+	2-	2-	1-	0+	0+	1+	8+
4	2-	1o	0+	1-	2-	1-	1o	1+	8+	6+	4o	4+	3+	2o	2o	3o	1o	26o	1+	3o	3-	1o	2-	1+	2-	1+	14o
5	3-	3-	2-	2+	3-	3-	2+	2+	19+	4-	1+	1+	1o	1o	2-	2+	2o	14+	4-	3+	3-	2+	2o	1-	1o	1o	17-
6	4-	0+	1o	3+	4-	4-	3o	3+	22o	2o	2+	2o	2-	2-	2+	2+	4-	18o	1+	2-	1o	1+	2+	2+	2-	2-	13+
7	4-	3+	4o	2+	2o	2o	2+	2o	22-	3o	3o	3-	3o	2+	1+	2-	1+	18+	2-	2-	2o	2o	1+	1+	2-	1+	13o
8	1-	1-	1-	1+	1+	1+	2-	1+	9o	1+	3-	1+	1o	0+	0+	0+	0+	8-	1+	1o	0+	1o	1o	1+	2o	1+	9+
9	1o	2o	1+	2+	5o	3o	2o	4o	21-	1-	1+	1+	1+	1+	2-	1o	1o	10-	1o	2+	1+	1o	1-	1+	1-	2-	10o
10	5o	4o	3-	1+	1-	0+	0o	1-	15-	1-	2o	1+	1+	1-	1+	1+	0+	9o	1+	2o	2-	1+	1o	2+	4+	6o	20o
11	1-	1+	1o	1o	3+	4-	3+	4o	18+	1-	1-	1-	1+	0+	1-	2-	2+	8+	6-	6-	4+	3+	3+	3o	2-	1+	28+
12	4o	2o	2-	1o	0+	0+	1o	0+	11-	2-	2-	2-	0+	1-	1-	2-	1-	9o	0+	1o	1-	1+	1-	0+	1o	1+	7-
13	0+	1o	0+	1-	2o	1-	1o	4-	10-	1+	2-	1o	0+	1-	1o	1-	1-	7+	2+	2-	3+	3-	2+	2o	2o	3o	19+
14	2+	3+	4+	4o	5o	5+	5o	2+	32-	1+	1-	2-	0+	0+	0+	2-	3-	9o	2o	4-	3+	4o	2o	2-	2-	2o	20+
15	3o	3-	3-	2+	2o	3o	3o	2+	21o	3-	3o	3-	1+	2o	1-	1-	1o	14o	3+	2+	2+	2o	2-	0+	1o	1+	14+
16	1+	2-	1-	1o	2+	3-	2-	1+	13-	0+	0+	1-	1o	0+	0+	0+	1o	4+	1-	2+	3+	2o	1+	2o	3o	2o	17-
17	2+	2+	3o	1-	1o	1+	2o	2o	15-	1-	1+	1-	1+	1o	1o	0+	1o	7+	2+	4o	3o	2-	2+	2o	1o	1o	19+
18	1o	1-	0+	0+	1o	1+	2+	3-	10-	1+	1-	1+	1-	1-	1-	2-	0+	7+	3-	3-	1-	1-	0+	3o	3-	3+	16o
19	1o	1o	1+	1o	4o	4+	6o	3o	22-	1+	1-	1o	0+	1-	2+	1o	2o	9+	4-	3o	0+	1-	2o	0+	1o	0+	11+
20	4o	5o	4-	3+	2+	2o	2+	3o	26-	1+	0o	1o	0+	0+	1o	2-	1-	6+	0+	0o	0+	0+	1-	0+	1-	3-	5+
21	3-	2+	3-	3-	3-	1+	2+	3-	19+	2-	2-	2-	1+	1-	1-	0+	2+	10+	4o	3o	1-	0+	1-	0+	2-	2+	13o
22	4o	4+	6-	5o	3+	3o	4+	5-	34+	1+	6o	8o	8-	6-	3o	4+	2+	38+	1+	1-	1+	3-	2o	2-	1+	1+	12+
23	3o	3+	3o	3o	3-	4+	5-	4o	28o	3-	1o	2-	1-	1+	1-	1o	1o	10o	2+	2-	1+	2o	1+	1+	2-	3o	15-
24	6o	5+	3-	3+	3o	3-	4o	4-	33-	1-	0+	0+	0+	0+	0+	1-	0+	3+	3o	4+	4-	2o	2o	1+	1-	2-	19-
25	5-	4+	3-	3-	4-	4-	4o	3o	29-	0o	1+	1-	0o	1-	0+	1+	0+	5-	2o	2-	1-	1-	0+	1-	0+	1o	7+
26	3o	3o	3o	2o	3o	3-	1o	1-	18+	2-	2-	2o	1+	1+	1o	2o	2-	13-	1+	1-	3o	3-	2+	2+	1o	1+	15-
27	1+	1o	2-	1+	1+	1+	1+	1+	11-	2+	3+	2+	2-	2+	4+	3+	4-	23+	3o	1+	3+	2-	2-	2o	2o	0+	15+
28	2-	1+	2-	1-	1-	1-	1o	1o	9-	3o	2o	2o	4-	4o	2o	1o	2o	20-	0+	2o	2+	1+	2-	1+	1+	1o	11+
29	0+	1o	0+	0+	0+	1o	1+	2-	6+	3o	4-	2-	2+	0+	1-	1-	1o	13+	1+	1o	1-	1-	0+	0+	0o	0o	4+
30	1o	1o	2o	1o	2+	2+	1o	1-	11+	2o	1-	1o	0+	0o	0+	0o	0o	4+	0o	0+	1-	2-	4o	5+	7-	6o	25-
31	0+	0+	1o	1-	1o	2+	2-	2o	9+	1o	0+	1-	1+	1o	0+	0+	1o	6o									

October 1937										November 1937										December 1937									
D	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum
1	5+	4+	5o	3+	3-	3+	4+	3o	31+	0o	0o	1-	1o	1+	1o	1+	1+	7-	5o	4+	4+	3o	3-	2+	3-	0+	25-
2	3o	2o	3-	2o	1-	0+	1-	0o	12o	3+	3o	2+	3-	1-	1+	2+	2o	18-	3o	4-	4o	3-	2-	1+	1o	1+	19-
3	2+	3-	2o	4-	4+	4o	4+	5+	29-	2o	1+	3-	1o	0o	0+	1-	0+	8+	2-	2o	3-	1+	2+	0+	2-	2-	14-
4	7o	7+	8-	4o	3+	4-	3o	3+	39+	0o	0+	2o	1-	1+	1-	0o	0o	5o	2o	2-	1+	2-	1-	0+	1-	1-	9o
5	2+	1+	1+	1o	3o	3-	1o	2+	15o	0o	2-	2o	1c	1-	1-	1o	0+	7+	0o	0+	1-	0+	1-	2-	2o	1-	6+
6	2o	2+	2o	3+	3o	3-	2+	1+	19o	0+	0+	1o	1o	1-	0+	0+	1-	5-	2o	3o	0+	2+	2+	2-	2-	2+	16-
7	3-	4o	4o	3-	4o	4-	4-	4+	29o	1+	2+	2-	2-	1+	3-	3o	3+	17+	2o	3-	3+	3o	2o	4-	4-	2o	22+
8	6-	7-	5o	3+	2+	5-	2+	2-	32-	5-	3+	2+	2+	2+	3o	3+	4-	25o	3-	3o	2-	2-	3o	3+	2+	2+	20o
9	0+	1+	3+	4-	6+	6+	6-	4+	31+	3o	3o	4-	3o	4+	3-	1o	2o	23-	3-	3-	1-	1+	1o	2-	2+	2+	15-
10	5-	5-	6o	6-	4o	3-	2+	4o	34o	1+	1+	1o	1+	2+	2+	0+	1o	11-	3-	2+	2o	2-	3+	2+	2+	3-	19+
11	3-	3o	3+	4o	7o	6o	5+	4o	35+	1o	2o	2-	4-	2+	2-	3+	3-	18+	3o	4o	4-	3o	3+	2-	2o	2-	22+
12	3+	2-	4+	5o	3o	2-	5+	5+	30-	3o	3-	2o	3-	1+	1+	3-	2+	18o	3-	2-	1o	0+	0+	1-	1o	0+	8o
13	4-	3-	3+	3+	4-	3o	1-	0+	21-	1-	2-	2-	1+	0+	2o	2+	1o	11o	0+	1-	1+	2o	0+	0+	1-	1-	6+
14	1+	5-	4-	3o	2o	2-	2-	1-	19-	2-	2+	1o	2o	2o	1c	0o	0+	10+	0+	1-	1+	0o	0+	1-	0o	0+	4-
15	1o	2o	4o	4+	4o	3-	5o	2o	25o	0o	0o	0c	1-	0+	0o	1-	0o	2-	0o	0c	0+	2-	2-	1-	1-	0o	5o
16	2-	0+	3o	2+	2o	2+	2o	2-	15+	0+	0o	0o	0o	0o	0o	0o	0o	0+	2-	1+	0o	0o	0o	0o	0+	0+	4-
17	2-	2o	1+	1-	0+	1o	1o	2-	10-	1-	1o	2+	1+	1o	2o	2-	2-	12-	0o	0+	0o	1+	1-	2o	0+	1-	5+
18	3-	2-	2-	2+	1+	0o	1-	1+	12-	3o	5-	3+	5-	4+	4o	4+	4+	33-	1+	3o	3-	3+	3+	5-	4+	4-	26+
19	1-	1-	1-	2+	2+	1o	2+	1-	11-	3-	2o	4-	5-	5-	4+	3o	3-	28-	4-	3o	4+	4o	3o	4+	4+	3-	29+
20	0+	0+	0+	0o	1o	0o	0o	0o	2o	2+	3o	4o	4-	4+	4o	2o	2+	26-	3-	4-	3-	3o	3o	4o	4-	2+	25o
21	0+	0+	2o	2+	2o	2o	2o	2+	13+	2+	3o	2+	3-	3+	2o	3o	3-	21+	2+	2o	1+	0+	0+	2+	2+	2+	13+
22	1o	2o	2+	3+	3+	2+	3+	4-	21+	3-	3+	3+	5o	4-	4o	4o	3o	29o	2o	2+	4-	3-	3o	2o	?-	2-	19o
23	3+	3+	4+	4o	4-	4+	4-	6+	33o	3+	4-	4-	4-	4o	4o	4-	3+	29+	3-	2+	4-	4+	6+	6-	5o	1+	31+
24	6+	2+	3+	4+	5-	4o	4-	4o	33-	3-	4-	4o	3o	4o	2o	3-	2+	25o	1+	1-	1c	0+	1c	4o	5-	3+	16+
25	3+	3o	3o	2+	4-	3+	2o	2+	23o	2+	0o	2+	2-	1+	1+	2o	2-	13-	2-	2+	3o	3+	3-	0+	1o	3-	17o
26	3+	5o	5o	4o	3o	4o	4o	4-	32o	1+	2-	2-	0+	0o	1+	0o	1+	8-	3o	4o	3+	4-	4-	2+	1-	1-	21+
27	3-	4-	4o	4o	4+	4-	3-	3o	28o	0+	0o	0+	1-	1+	2-	3o	3+	11-	2-	1+	2-	1o	0o	0c	0o	0o	6-
28	3o	3-	3+	3o	2+	3o	3o	4o	24+	2+	4-	4o	3:	4o	3+	3-	3+	27-	0o	1-	1-	1-	2-	1o	0o	1o	6-
29	2+	2+	2+	1o	1+	3-	2-	2-	15+	4-	2o	3-	4+	4o	4+	6-	3+	30o	2o	1+	0+	0o	0+	0+	0+	1-	5+
30	3-	1-	2-	1o	0+	0o	1o	1-	8o	2-	4-	3o	4-	4o	5-	5+	5o	32-	0+	0o	1-	2+	2o	1o	0o	1+	8o
31	2-	1-	1+	1+	2-	0+	2-	1-	9+										1+	1+	1-	0+	3o	3o	3+	3+	16+

Table 85 (continued). Geomagnetic planetary three-hour-range indices Kp.

	January 1938									February 1938									March 1938								
D	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum
1	3o	3-	1+	2+	1+	2-	2+	3-	17+	2o	2+	2-	2+	4o	2+	3-	4o	21+	4+	4+	3+	3+	4+	4o	5o	3+	32o
2	2o	2+	2-	3-	3+	3-	2+	2o	19o	3+	3o	3o	3+	3o	2+	2o	2o	22o	3+	2o	3-	2+	2o	1+	1o	2o	17-
3	3o	1+	2-	2-	3o	2+	3+	1o	17+	3+	3-	3+	3o	3+	4o	3-	3-	25o	3-	3o	2o	1+	1o	1o	1o	1o	13o
4	2+	3-	2+	3+	5+	4+	5o	4+	30-	3o	2o	2+	2o	3+	4-	3o	3-	22o	0+	1+	2o	1o	1o	2o	3-	3+	14-
5	4-	3+	3o	4-	1-	0+	0o	0+	15o	3o	3-	2o	3-	3-	2-	2o	0+	17o	3o	2+	5-	3+	5+	6-	5+	4-	33+
6	0+	0+	1+	2o	3-	5-	3o	2+	17-	2+	7-	6+	4o	4-	5+	5+	4+	38o	5o	4-	4o	3+	2-	2o	3o	3+	26o
7	4-	3o	2-	2-	3o	4+	4+	5-	26+	4o	4o	3+	3o	5o	4+	3-	3-	29o	3-	1+	3-	2o	3o	2+	2-	1o	17-
8	5-	5+	4-	2+	1o	0o	1o	4-	22-	2o	2o	3-	3+	3+	6o	6+	5+	31o	2-	2+	2-	1+	1-	1o	0+	2o	11o
9	5-	3+	2+	1+	2-	1o	1o	0+	16-	3+	6-	4+	4+	4+	5-	4-	3o	33+	1-	2-	1o	1-	1-	0+	1o	2+	8+
10	2-	2+	1-	1o	1+	0o	1o	0+	8+	4+	6o	6-	4-	4+	1+	1-	2+	28+	1+	1o	0+	1-	1o	0+	0+	0+	5+
11	1+	1-	1+	1o	1o	2o	1+	1-	9+	4o	5+	6-	4+	2o	3o	2o	1o	27+	0o	1o	1+	1o	0+	1o	1+	3-	9-
12	1-	1o	3o	2o	1+	3o	4-	5o	20-	1-	2-	3+	3o	3o	2-	1+	3-	17+	3+	4o	3o	3o	4-	4-	1+	2-	24-
13	5+	6-	5-	4o	3-	3o	3-	2-	30-	3+	2+	3o	4-	3+	3-	3+	3+	25o	1o	2o	1o	1o	1-	1+	1-	2-	9o
14	1o	2o	3+	2-	3+	2-	2-	2-	16+	3+	4o	5o	5o	6-	6-	4+	2o	35o	2+	4-	3+	3+	3-	2o	2+	2+	22o
15	2o	2o	3o	2o	2o	1+	3o	3-	18o	0+	1o	2o	1o	1-	1-	1-	1+	8-	3+	3+	2+	3-	3+	1+	2-	1o	19o
16	1+	2-	3-	2+	3+	4o	3+	8-	26+	2-	1-	2+	2o	1o	1-	1-	2-	11-	0+	0+	0+	2-	0+	1o	1o	2-	7-
17	7-	6+	7-	6+	8+	8-	5-	6+	53o	1-	0o	2+	2-	2-	0+	1o	2-	9+	2+	2o	2-	2-	1+	2o	0+	1-	12o
18	4o	5-	3+	3o	4o	5+	5-	5o	34o	1+	3o	2+	2o	3-	2o	1-	2-	16-	1o	0+	1o	1-	0+	0+	0+	0+	4+
19	4-	3+	4-	4-	4o	5o	4o	2+	30-	2-	0+	1-	0+	0+	0o	0+	1o	5-	0o	0+	1o	1-	0+	0o	0o	0o	2+
20	2o	4o	4o	4-	4o	4o	5-	4-	30o	0o	1o	2o	1-	2o	1-	0o	1+	8-	0o	0o	0+	0+	0+	0+	1o		3-
21	3+	5-	6-	5-	5o	4o	3+	5o	36-	1-	1-	1+	3o	0+	0o	0o	0o	6c	1o	0+	0+	1+	3-	2-	2-	4+	13+
22	6-	7+	8+	8+	7-	7o	5+	4+	53o	0o	0o	0+	1-	1-	1-	1o	2-	5o	4-	5o	6o	5o	5+	4o	4+	5+	39-
23	3o	3o	3o	3+	2+	2+	3+	4+	25-	3o	3o	3+	2+	4-	3+	3-	3o	24+	6-	5o	5-	6-	2+	4-	6o	6o	39o
24	3+	4-	3+	3o	3-	3-	3-	3o	24+	2o	2+	3o	2o	2+	1+	2o	2+	17+	6+	6+	6o	5-	3-	2-	2o	3-	32+
25	4o	3-	2-	5-	6o	7+	9-	8+	43+	2-	1-	2o	4o	3+	4+	4o	2-	22-	2+	2+	3-	3+	3o	2+	3o	4+	23+
26	8+	6+	4+	5-	4o	4+	4o	2o	38o	2o	2o	1o	3-	3-	2o	3+	3-	18+	6+	4-	1+	4-	4-	3+	3o	3-	28-
27	2-	1+	3o	2o	3-	4-	3+	3-	20+	2o	2o	1+	2o	3o	3o	3-	4-	20-	4o	2-	2-	1-	1-	0+	2-	1o	12-
28	2-	2o	2-	2o	3+	1+	3o	3o	18o	4o	3-	3+	3+	3-	2+	4+	4o	27+	2-	2o	1-	1-	1o	0+	2-		8+
29	2-	4-	2+	3+	1o	1-	4-	5-	21o										I+	0+	1+	2o	2+	3+	4+	1o	16o
30	3o	2-	1+	1+	1o	0+	3-	3-	14o										1o	2o	2-	1o	0+	0+	0o	0o	6+
31	3-	2+	3+	4o	3+	4+	6o	6o	32o										0o	0o	1o	1o	1o	0+	1o	1o	5o

	April 1938									May 1938									June 1938								
E	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum
1	1o	0o	1-	2o	1+	2+	2+	1+	11o	1-	1-	1o	1o	0+	0+	2o	2+	8+	2o	1o	3-	1+	2-	1-	1+	2-	12+
2	0+	0+	1-	1o	0+	0+	2o	2o	7o	2o	2+	2o	2o	3-	1+	1o	2-	15o	2-	1+	1+	2-	3-	3o	4+	5o	21o
3	2+	1o	1o	2+	3-	3-	2o	2-	16-	2-	4-	3o	3-	2o	3+	3+	4o	24o	4o	1+	1o	1+	1-	0+	1o	2-	11+
4	2o	3o	2o	3-	3o	2o	1o	1o	17-	4o	6-	4-	2o	4+	7o	5o	3+	35o	2o	2+	1o	2-	0+	1-	0+	1-	9o
5	0+	1o	1+	0+	0+	0o	0o	0+	4-	4o	4o	1o	2o	2-	4o	4o	4o	25-	3-	3-	2o	2+	1+	1+	2-	0+	14+
6	3-	3+	5+	4o	2+	2-	3+	4o	27-	3-	3+	3o	3-	3o	3-	1+	1-	19+	2-	1-	1+	1-	2o	2+	2-	1o	11+
7	4+	5-	3o	3+	4-	3-	2-	2+	26-	1-	0+	1+	1+	1o	3o	0+	0+	8+	1o	1+	1o	1-	1+	1o	1+	4+	12o
8	2o	2o	2o	3-	2o	2+	2o	2+	17+	1o	2-	1+	1-	2o	1+	1+	2-	11o	4-	5-	5-	4+	4-	4+	5-	4-	34-
9	1+	1o	2-	3o	4+	2+	3+	2+	19+	1o	0+	0+	1-	1+	1+	2-	3o	10-	2o	2+	3o	1-	2o	2+	1+	2+	16o
10	2+	2-	2-	3o	3o	3o	1+	1o	17o	3+	2+	2o	1o	2o	2-	1o	1+	15-	1+	2o	2+	3o	3o	4-	4o	3-	22o
11	1-	2-	2o	3+	3o	5-	3+	4-	22+	3-	3-	2o	2+	2o	8-	9-	9-	37-	3+	3o	3o	3o	3o	3o	4-	4o	26o
12	2-	2+	3-	3o	3o	1+	4-	3o	21-	7+	7-	6+	4o	4+	5-	5-	7-	45-	4+	4+	4o	4-	2+	4o	5+	5-	33-
13	2+	2-	2+	4+	5o	5o	4o	7-	31+	6+	2-	1-	1o	2+	1o	1o	3-	17-	4-	5o	5-	4o	4-	4-	3-	3+	31o
14	6-	6+	7o	5o	5+	4+	4+	3+	41+	3o	3+	3+	6-	4+	4-	6+	3-	35o	0+	1+	1+	1-	1-	0+	0+	1+	6+
15	5-	4-	3o	4-	3+	3+	2+	3-	27-	5+	5+	3o	3-	3o	3+	2-	3o	27+	2-	1-	0o	0+	0+	0+	1o	1o	5+
16	3+	7o	9o	8o	8-	6-	4+	5+	50+	3-	4-	4-	3-	3-	3o	3+	3-	24+	0o	0+	2+	2+	3-	2+	2+	2o	14+
17	2o	3-	3+	4-	4o	4+	4o		28-	4-	3+	3o	3-	2o	2+	3+	2o	22+	2o	2-	1+	0+	1o	1o	3+	1+	11+
18	4-	3o	4-	3o	2+	3+	4-	3+	26o	2-	3o	3-	2-	1o	1-	1o	1-	12+	1+	1o	2+	1+	1+	1o	1o	2-	11o
19	4-	2+	2o	2+	2o	3-	3o	2+	20+	1+	1o	1o	1o	1-	1+	2o	1+	10+	1o	1o	1-	0+	1+	3-	1-	1-	8+
20	2+	2-	1+	1o	2+	2-	2-	2-	14-	1+	1-	0+	0+	1+	1-	1-	2-	7o	1o	1-	1-	0+	1-	1-	1o	2+	7+
21	2+	2o	2o	2-	1+	2o	2+	2o	16-	1o	1-	2+	2o	2-	1+	0+	1o	11o	3o	3-	3+	4-	3+	2-	2-	2-	21o
22	3o	3-	1+	2-	3-	3+	4o	3o	22+	1+	1+	1+	1+	2-	3-	2-	1+	13-	2-	3-	3-	2o	1o	1-	1-	1-	12o
23	4-	3-	5-	5o	5o	6-	5-	5+	37-	1o	1o	1-	0+	0+	1-	1-	1-	5+	0o	0+	0o	0o	0o	0o	0+	0o	1-
24	4-	3+	3-	3+	2+	2o	2+	2-	21+	0+	1-	1-	2o	3+	5-	4-	4+	20-	0o	0+	1+	1+	2-	1o	2-	1+	9-
25	3+	4o	3o	3+	3+	3-	3+	3o	26o	3o	3o	2o	2-	2-	1+	2o	3o	18-	2-	1o	1-	[illegible]	2o	1-	1-	1+	9-
26	2+	1o	2-	3o	3o	2o	1-	1+	15o	1+	2+	2-	1-	1-	1o	0+	1-	9-	[illegible]	2-	1+	1+	1o	1o	1+		10o
27	1+	2o	1o	1o	1o	2-	1+	1-	11-	1o	2o	1+	1o	1+	2+	3-	2o	14-	1+	1+	1o	2o	1o	1-	1o	1+	10-
28	1o	1+	0+	1o	1-	1+	0+	0o	6o	1+	2-	5-	2+	3o	3o	3-	3-	22o	1-	0+	0+	1-	0+	0+	2-	1+	6-
29	2o	2o	1o	0+	0+	0+	0+	1o	7+	3o	4o	5-	4o	6o	6-	3+	4o	35-	1+	1-	2o	0o	1o	2-	4o	2-	12+
30	0o	0+	1-	1o	2o	2o	1o	1o	8o	3-	1+	4-	3o	4-	1o	2+	2o	20-	2-	2+	2-	2-	2+	2o	1o	1+	14o
31										2-	1+	2+	2-	1-	1o	2o	2o	13-									

Table 85 (continued). Geomagnetic planetary three-hour-range indices Kp.

	July 1938			August 1938			September 1938		
D	1 2 3 4 5 6 7 8	Sum		1 2 3 4 5 6 7 8	Sum		1 2 3 4 5 6 7 8	Sum	
1	2+4+4o4o 4-3o3o5-	29o		1+1+3+3o 3-5-3+5-	24+		1+2-2o1o 1-1+1+1+	11-	
2	3o4+4-3- 3-2o1+1-	20+		4+6o3o2o 2+3o4-5-	29o		1-1-1o2o 2o1o1-2o	10o	
3	0+2+2o1- 1o1-0+0o	7+		4o2o2-0+ 0o3-2+7+	20+		2+2+3-3o 2+2+1+2o	18+	
4	1+2o2o2o 5+5o6-6o	29+		5+5-7-6- 4o4+4-5o	39+		1o1o1+2- 2-3-1+3o	14-	
5	4+4o2o2o 5-2+3-1+	23+		5o5o4-2o 4+4o4+3o	31+		3-3-2-2+ 4-4-1o0+	18o	
6	3-4-3-3- 3o3o2o0+	20o		3o3+3-2+ 1+3-3-2+	20+		0o1-1-2o 2o1-1-2o	9-	
7	1o2-2-0+ 1+1+1+2o	11-		1+3o3-1+ 3o4-2+1+	19-		2o3-2-2- 1+3+2o1-	15+	
8	2o2o2o2- 2o1+1o1-	13-		1-2-2-2- 1+1-2o2-	11+		2+2o2-2o 2o2o2+1o	15+	
9	2-1-2-1o 0+2-4-4+	15o		1+1-1+0+ 2-0+1o1+	8o		0o1-2+2+ 3-3-3-2-	15o	
10	5-4-4-3- 3o5-5+4-	31+		1+3+3o2+ 3-3-2o2+	20-		2-2o2+3- 3-2-2-2-	16+	
11	4-3-1+1- 0+0+1o0+	10+		3o3+4o5+ 6o6-4e4-	35e		2o3o1o2+ 2+2-2+2-	17e	
12	1o1+1o1o 2+1+1-1e	10-		3-3o3-2+ 2o2o3-2o	19+		3-3o3-2o 2o2-2+3-	18e	
13	1-1+1+2- 2+2o4-5-	18-		3o3o2+1- 1o0+1+1-	12+		2-4+2+2e 1o2o5o5+	24-	
14	5+4+2o2+ 3o2+3+2+	25o		1-1-0+0+ 2o1o1+1+	8-		5o6+2+2o 4-6o6-6-	37-	
15	2+3+5o4+ 6+6+7o7-	41+		0+0+0+1- 0o1-1-0+	3+		6+7-7-7- 7+6+6+4+	51-	
16	5o3o3+5e 4+3+5o3+	32+		0+0+0+0+ 0+0+0+0+	3-		4o3o2o1+ 2-2o3o3+	20+	
17	2o3-3+1e 0+1-1+0+	12-		0+0+1o1o 2-2o1o1o	8+		3o4o2+1+ 2+3-1+0e	17o	
18	0o1-1-1e 1+2-1+2-	8+		2-1-0+0+ 1-1-1o1-	6e		2o2-2o2- 2-1+0o2-	12o	
19	3o1+2+2+ 2o1o1+1e	14+		0+1+1-1- 1-1+1+1o	7+		1+1-1+1- 0+1o1+2-	8+	
20	1+2-2+1e 1e2o1+2o	13-		1-1-1-1- 0+0+1-0+	4+		3-1+2+1+ 2o1+0+0+	12-	
21	2+1+2-2- 2-1+1+1+	13-		0+1-1o1o 2+2+3o2-	12+		0+1e2o1+ 1+2-3-3o	13+	
22	1-2-2-1. 1e2+1o1-	10+		1+2o0+1- 5o4+4+3o	21e		2+3+3+4- 3-2o1e0+	19-	
23	1e2-2-1- 1+2o2-2+	12+		4-4-4-6e 5o3o3-2-	29+		2o4o3o2- 1+1+1o1+	16-	
24	2-1-1o1e 1+1o1+2-	10-		1+1-1e2- 2o2-4-4o	16e		0+0+0+1e 1o1-1-2-	6e	
25	2e0+0+0+ 0+1-0+0e	4+		4o2+2-1- 1o1+2+1e	14+		0+1-1-1+ 1o1+1+2+	9e	
26	0e0+1o1- 1+1o1-0+	5+		1o1e2-1e 1e0+1+1+	9-		3+3-5+5+ 5-5-5o5-	36-	
27	0+1+1+1- 1o1o1-1+	8-		1o1-1e2- 1-1-1-1e	7+		3-3-4e3e 3e3e3e7e	28+	
28	0e1-1-0+ 1-1e0+0+	4e		1-1-1o1e 1e3e3e2+	13-		8-7e5e4- 4e3+3+2e	36e	
29	0o1-1+2+ 3-2e3-3+	15e		2+2e3e2e 1e1+4-2+	18-		2e4-4+4e 3+2+2e2e	24-	
30	4-6e6-5+ 5e3e5-4+	38-		3e4e2e2+ 2+2-2+1e	19-		1+2e1+4- 5-3e7-5e	28-	
31	3+1+1o1+ 1-0+1-0+	9e		2e3-2-2- 2-0+0+0+	11-				

	October 1938			November 1938			December 1938		
D	1 2 3 4 5 6 7 8	Sum		1 2 3 4 5 6 7 8	Sum		1 2 3 4 5 6 7 8	Sum	
1	6-7+5-4+ 2e3-4-4e	34+		1+1o1-2- 3o1+1o1-	11-		0+0e0e0+ 0e0e1e1e	3-	
2	4-4-3-3- 3+3+3e3+	26-		0+1-1e2- 2+2+1-1e	10e		1o1-2-3- 3+3+5-5e	22+	
3	4-3+2+2e 1e3+3+4e	23e		1-1-1e2- 1-1e2-1+	9-		5e4+4-3e 3+4e4+4e	32-	
4	2+3e1+3e 4-1+2-1-	17e		1+1+1+2- 1+1+2e1e	11+		4e4-1+1+ 0+1e2e1e	15-	
5	0e0+1e1e 0+0e0+0+	3+		1e1e1-1e 1e2e1e0+	8e		1+3-2-3e 4-2+1-1-	16e	
6	0e2+3-2+ 2+2-2e0+	14-		2-2-2-2e 2-1+2-1+	13e		2e2e2e2- 1e1+2e2-	14-	
7	0e2+5-5- 7e7e7e5+	38e		1-1e2+2- 1-1-2+2-	11e		2-1e0e1- 1e2-2e1-	9-	
8	6-7e7-5+ 5-4e4-2+	39+		2-4e3e4- 4e5-3+5-	29e		1-0+0+1- 0e1-0+0e	3e	
9	3e2-4-3+ 1+2e2e3e	20e		5e4e4e4e 4e5e4+4e	34+		1e2e2-2+ 2-3e3-3e	17+	
10	3+3e1+2- 3-2-2+3e	19e		4+3e2e1+ 1e0+1e1e	14e		2+3-3-3+ 4e5+6-4+	30+	
11	3e3+3-2+ 3-2e2e0e	18e		1-1e1e1- 1+1e1+1e	8e		3-3-3e3- 1+2+2-2-	18e	
12	0+1-2-1e 1-0+2-2-	8e		1e1-1e0+ 0+0e0e0e	3+		2-2+3-2+ 3e2e1+1+	17-	
13	0e0+1e1- 0+1-2e2-	7-		1+1-1+1- 1-0+0e0+	5+		2+3-2+2+ 2e2-3+2+	19e	
14	1e1-1-0+ 0+0e0e1-	4-		1-0+1-1- 2e3-3+3+	14-		2+2-2-2+ 2e2+3+2+	18e	
15	0+0+1+2- 2-0+1+1+	8+		3e2e1+1- 1-1-1+3e	13-		2e2+3-1+ 2-1e1e1+	13+	
16	2e2e2-3e 4-3-2+3+	21-		1+1+2e2- 2e1+1-3-	13e		1e1+3e3e 3-4e5+5-	25e	
17	3e1-1+3- 2e2e1-0e	12+		2e3-2e3+ 5e5e4-4e	28-		5e5-5-4- 3+4-4-4e	33-	
18	0+1e2-2- 1-1+2e2+	11e		2+2+3-3+ 3e1+3-2e	20-		5-3e4e4+ 5e6-5-4-	35e	
19	3-3+2e2- 2+2-2e3-	18+		3-2e2+3+ 2-1e2-1+	16e		3-4-4e3- 4-4+3+3+	28-	
20	2+4e4-3- 3-2+3+2-	23-		2-2-3e3e 3e2+2-1+	18-		3+3+2+2+ 3-3e3+3+	24-	
21	2-2e1+3- 3-1+2-2-	15e		2-1+3-4e 4+4e4e4-	26-		2-2e3e3+ 3+1e1e2-	17e	
22	0+1-2e2e 2e1+3-2-	13-		3-4+4-2+ 3-2e1+2e	21e		3+4e5-5- 4e2+2+2e	27+	
23	1+3e4e4e 3+3+3-4-	25+		3e3e4-2+ 3e3e2e3+	23+		3-2e1e1+ 2e0+1e2-	12e	
24	3-3+3e3+ 4+4+3e5-	29-		2e3+3+3e 3+4-4-3e	25+		2e1e2-1- 1-0+1+1e	9-	
25	5+4+4e5- 5-3e4e5-	35-		3+3e3-3+ 2+3+2-2-	21+		2-0e1-2- 2e1-0+0+	7+	
26	3+4-4e4e 5e5e4e5e	34e		3e3+4+4e 3+3+2+3-	26+		1+1-0+0+ 0+0+1-0e	4e	
27	5-4e5e5- 5-4+4e3e	34+		3-3-2-2+ 2e1e1-1+	14+		0+0+0+0+ 0+0+1-2-	4+	
28	4e4e3+3+ 5-4-4-2-	28+		1-1+2+2e 2e1+1+1e	12e		2e1+0+2- 3-2e1+2-	13e	
29	3-2+3+1+ 1-3-3-2e	18-		2e2e2e1- 0+1+1e2e	11+		0+1e1+2e 1-0+0+1+	7+	
30	4-1+1+1e 0+0+0+0e	8+		2+0e1-1e 0+1-1-0e	6-		1+1+0+1- 1e2+1+1+	10-	
31	1-2e1-1- 1-0+0+1e	6+					2-0+1+1- 0+0+0e1e	6-	

Table 85 (continued). Geomagnetic planetary three-hour-range indices Kp.

January 1939										February 1939										March 1939									
E	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum		1	2	3	4	5	6	7	8	Sum	
1	1o	1-	1+	1o	1o	0o	1-		7-	2o	1o	1o	2-	3o	3o	4o	4o	20-		3-	3-	3o	4-	4-	4o	3+	5o	28o	
2	0+	2-	1+	2o	2-	1-	1o	1-	9+	5-	4-	3-	2o	2+	3+	4o	4o	27-		5+	6-	4-	4o	3+	1+	2o	2+	28-	
3	2-	2-	1+	1o	1+	0+	0+	0+	8o	2+	3+	2+	2+	2o	2-	3-	3+	20o		2+	4-	3+	3+	3+	4-	3-	5-	27o	
4	0o	1o	1o	0+	0o	1-	1o	1+	5+	3-	3-	2+	4-	3-	1-	1+	1+	17+		5o	5o	4-	3o	4-	3-	4o	4+	31+	
5	2-	3+	2-	2o	3-	2+	2+	3+	19+	2-	2o	2o	3-	2+	2o	4o	4-	20+		3+	2o	2o	3o	2+	3o	4-	3+	23-	
6	2o	1+	1o	2-	2-	2+	3-	3-	15+	3o	4o	4+	5+	5+	5+	5+	5o	38-		3o	3o	3+	3+	3o	5+	3-	3-	24+	
7	2+	2-	1+	3-	2-	2-	3-	2+	16+	5-	5-	3+	5+	4o	3-	3o	2o	28-		3+	3-	1-	1+	1+	1o	1o	2+	14-	
8	3o	3+	2-	2-	1+	1+	3+	2+	18o	2o	1o	1-	1+	2-	1+	2o	3o	13o		3o	4+	4-	3o	2o	2-	3o	2-	22+	
9	2+	3-	4-	3o	2-	2-	2o	3o	20o	2o	2-	1o	3-	2+	2+	3+	4-	19o		3-	4-	5o	4-	3o	3-	3o	2-	25+	
10	2o	3+	2o	2+	3o	2o	2+	2o	19o	3+	3+	2o	2o	3+	4-	3o	3-	23+		3+	2+	2-	1+	3o	2o	2o	3o	19-	
11	2o	2-	2-	2-	2o	2o	3-	3o	17o	4+	5-	3-	3o	2o	1-	1o	0+	19-		1o	2-	3+	3o	2+	4o	2-	3o	20+	
12	2o	2o	2-	1o	2+	1o	1o	1+	15-	1-	0+	1-	0+	1o	1-	0-	0o	4-		3+	3-	2+	3-	2-	3-	3+	3o	23-	
13	1o	1+	0-	1o	2-	1+	0-	1+	8-	0+	0-	1-	0+	0+	1-	2+	3-	8o		2+	1+	3-	3+	2+	1-	0-	1-	15+	
14	3+	3-	1+	2+	3-	3-	1-	4-	20+	2-	1+	3-	2-	2-	2+	1+	2-	15-		1-	1+	2-	3+	3-	2+	1-	2-	15+	
15	1-	3-	2+	2+	2-	2-	1-	1-	15+	3+	3+	3-	2+	3+	3-	2-	1+	21+		1-	3-	3-	3+	3-	4+	3-	3-	22-	
16	1+	0-	1-	2-	1-	2-	3-	3-	12+	2+	4-	4-	2+	3+	3+	2-	3-	24-		4+	4+	4-	4-	4-	3-	3+	3+	30-	
17	4+	4-	3-	3+	3+	1+	2+	2+	24-	2-	3-	3+	3-	3+	4-	3+	2+	24-		4-	4-	4-	1-	2-	2+	3-	1-	21-	
18	3-	3-	2+	3-	3-	2-	0+	2+	14+	3-	1+	4-	2+	2-	3-	2-	3+	20+		2+	1+	1+	2-	1-	1-	0-	0+	9-	
19	1-	1+	2-	1+	1-	1-	2-	3-	11+	3-	3+	3-	2+	3-	2-	3-	2-	21-		0+	1-	1-	0-	0+	0+	2+	2-	7+	
20	3-	3-	3-	2+	0-	1+	2+	2-	17+	2-	3-	3-	1-	1+	3-	1+	1+	13-		4-	4-	1+	1+	1+	2+	0+	1-	15-	
21	2+	2-	2-	2-	4-	3+	4-	1+	20-	1+	2+	0-	1-	0-	0-	0-	0-	4+		0+	3-	5-	5-	3-	3-	5-	1+	24+	
22	1-	2-	2-	1+	2-	2-	4-	4-	17+	0-	0-	1+	2-	1+	1-	1+	1-	7+		3-	4+	4-	4-	0	4-	4+	4-	31+	
23	3-	3+	2+	3-	3-	2-	2-	1-	19-	3-	2-	1-	1-	2+	1-	2-	3-	14+		4+	4-	3-	4-	3-	4-	3-	4+	29-	
24	1-	3-	3-	1+	1+	0+	1-	2-	13-	3-	4-	2-	3-	3+	6-	7-	7+	35-		2+	2+	3-	2-	3-	2-	0-	2-	19-	
25	2+	2+	2-	2-	1+	0-	1-	1-	11+	7+	6-	7-	7-	6-	6-	5-	4-	45-		2-	3-	2-	2-	2-	1-	1-	3-	14+	
26	0-	0-	0-	0+	1-	1-	0-	0-	2-	2-	2-	1-	1-	1-	1+	1+	3-	11-		3-	3-	2+	2+	2-	2-	3+	3+	30+	
27	0-	0-	0-	0+	0-	0+	0-	0-	1-	1-	1-	1-	1-	2+	1+	1-	1-	8-		4+	4-	3-	3-	1+	3-	5+	5-	28+	
28	0-	1-	0+	1-	1-	2-	2-	2-	9-	1-	2-	2-	2-	2+	3-	3-	3-	18-		4-	4-	3+	4-	5+	6-	6+	7-	39+	
29	3-	1+	0+	1-	0-	0-	0+	1-	7-											6-	6-	6-	6-	6-	5+	6-	5+	46-	
30	1-	1+	2-	1-	2+	1+	1-	1-	8+											4+	4-	4-	3+	3+	4+	5+	5-	53+	
31	0+	3-	1-	2+	1+	1-	0+	0+	9-											4+	4+	2-	3+	3-	3-	3-	4-	27+	

April 1939										May 1939										June 1939									
E	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum		1	2	3	4	5	6	7	8	Sum	
1	4o	3-	4-	3o	3+	4o	3-	4+	32o	2o	1+	3+	4-	6-	7-	5-	6+	37-		2o	2-	1+	1+	4-	3-	4-	3-	21o	
2	4-	4-	2o	2+	3o	3+	3-	4+	26o	6o	5-	6+	5-	4+	4+	4-	4o	39-		4o	3-	3+	3o	4-	4o	3-	3o	29o	
3	3-	3-	4-	3+	3-	2+	3-	3o	24+	5-	4-	4-	4-	3-	3-	4-	3-	29o		3-	3-	3-	4-	4-	3-	3-	2+	24+	
4	5-	3-	3-	2-	2-	2-	3-	3-	24+	3-	2-	2-	3-	1-	2-	2-	1-	15+		3-	4-	3-	3-	3-	4-	4-	3-	26-	
5	4-	4-	4-	3+	4-	2-	2-	1+	25-	2-	3-	3+	3-	2-	3-	6-	5-	29+		2-	3-	3-	3-	3-	3-	1-	2+	21-	
6	1-	3-	4-	2-	2-	1-	1+	0+	15+	4-	3-	3+	4-	6-	5-	5-	5-	36-		2-	2-	2-	1-	1-	1-	1-	2-	12+	
7	1-	1+	2-	1+	2-	2-	1-	1-	11+	7-	6-	5-	5-	4-	4-	3-	4-	39-		2-	1-	1+	1-	2-	1+	1-	0+	9-	
8	1-	2-	2-	1+	2-	2-	4-	3-	18-	6-	4-	5-	4-	3-	3-	4-	4-	34-		2-	2-	1-	1-	2-	1-	1-	0-	10-	
9	3-	2-	2-	2-	3-	3-	4-	3-	23-	4-	4-	3-	4-	3-	4-	2-	2+	29-		1-	1-	1-	1-	1-	0-	0-	2-	7+	
10	3-	4-	3-	4-	3-	4-	3-	5-	32-	2-	2-	2-	1+	2-	4-	2-	1-	16-		3-	3-	2-	1-	2-	1-	1-	1-	14+	
11	3-	3-	3-	3-	3-	3-	4-	4-	32+	2-	2-	1-	3-	2-	1-	1-	0-	12+		1-	1-	2-	2-	2-	1-	1-	2-	12-	
12	3-	3-	4-	3-	3-	1-	2-	3-	24-	1-	2-	2-	1-	2-	1-	1-	2-	12-		2-	2-	2-	1-	2-	1-	0-	2-	11-	
13	3-	2-	4-	2-	2-	2-	2-	1-	18-	0-	2-	3-	2-	3-	2-	1-	2-	16-		3-	3-	2-	2-	2-	3-	4-	4-	23-	
14	2-	3-	2-	2-	2-	3-	2-	2-	19-	1-	1-	2-	1-	2-	1-	2-	1-	13-		3-	3-	3-	2-	3-	4-	4-	4-	30-	
15	1-	2-	2-	2-	1-	1-	1-	1-	11-	2-	3-	3-	2-	3-	0-	2-	1-	19-		3-	3-	3-	2-	3-	3-	2-	1-	21-	
16	1-	1-	1-	1-	1-	0-	0-	3-	7+	3-	3-	3-	4-	3-	2-	2-	2-	25-		4-	3-	3-	4-	3-	2-	0-	1-	30-	
17	6-	7-	8-	7-	7-	6-	4-	3-	53-	2-	2-	2-	2-	3-	2-	3-	4-	20-		1-	1-	1-	0-	1-	1-	2-	3-	10-	
18	2-	2-	3-	4-	3-	2-	2-	2-	20-	3-	4-	3-	3-	2-	2-	3-	3-	27-		3-	4-	3-	3-	4-	3-	3-	4-	28-	
19	4-	4-	5-	3-	3-	4-	3-	4-	30-	3-	4-	3-	3-	2-	1-	1-	3-	20-		4-	4-	4-	3-	3-	3-	4-	4-	29-	
20	4-	4-	3-	4-	3-	3-	2-	2-	24-	4-	4-	4-	3-	2-	2-	2-	2-	24-		4-	4-	4-	3-	3-	2-	0-	2-	24-	
21	4-	4-	4-	3-	4-	4-	3-	3-	30-	2-	2-	2-	2-	3-	4-	4-	4-	27-		4-	4-	4-	3-	3-	3-	4-	3-	28-	
22	4-	3-	3-	4-	2-	3-	3-	3-	25-	3-	4-	3-	3-	2-	2-	3-	3-	23-		3-	4-	3-	3-	2+	1+	2-	2-	20-	
23	4-	3-	3-	3-	4-	3-	3-	4-	27-	3-	4-	4-	3-	3-	3-	3-	3-	30-		3-	3-	2-	3-	3-	2-	3-	3-	23-	
24	3-	2-	2-	2-	1-	2-	2-	2-	16-	3-	3-	3-	3-	2-	2-	2-	2-	20-		3-	3-	2-	2-	2-	1-	2-	1-	17-	
25	2-	3-	3-	3-	3-	3-	3-	3-	24-	3-	3-	3-	3-	3-	3-	3-	3-	24-		2-	2-	2-	1-	2-	1-	1-	2-	11-	
26	3-	3-	2-	2-	2-	2-	2-	2-	18-	3-	3-	3-	3-	3-	3-	3-	3-	24-		2-	3-	2-	2-	2-	1-	2-	2-	18-	
27	2-	2-	2-	2-	2-	2-	2-	2-	16-	3-	3-	3-	3-	3-	3-	3-	3-	24-		3-	3-	3-	3-	3-	2-	2-	2-	21-	
28	2-	2-	2-	2-	2-	2-	2-	2-	16-	3-	3-	3-	2-	2-	2-	2-	2-	21-		3-	3-	3-	3-	3-	3-	3-	3-	24-	
29	2-	2-	2-	2-	2-	2-	2-	2-	16-	3-	3-	3-	3-	3-	3-	3-	3-	24-		3-	3-	3-	3-	3-	3-	3-	3-	24-	
30	2-	2-	1-	2-	2-	3-	4-	1-	17-	2-	2-	2-	2-	2-	2-	2-	2-	16-		3-	3-	3-	3-	3-	3-	3-	3-	24-	
31										2-	2-	2-	2-	1-	1-	1-	1-	12-											

Table 85 (concluded). Geomagnetic planetary three-hour-range indices Kp.

	July 1939									August 1939									September 1939								
E	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum
1	2+	2o	3+	4-	3-	2-	2-	2+	20-	2+	2+	1+	1-	1-	1o	1-	1o	10o	0+	1o	1o	1-	1-	2-	0+	0o	6-
2	3-	3o	3+	2o	2+	2+	2+	2+	20+	1-	1o	1-	0+	0o	0o	0+	0o	4-	1o	2-	2-	1o	1+	2o	2o	5-	15+
3	3+	4o	4o	5o	7-	5o	6-	3o	37-	0o	0o	0+	0+	1-	0+	0+	1-	3-	6o	6o	6o	5-	5-	3o	3+	3+	35o
4	3+	3o	2o	2+	4+	5+	6+	7-	33+	0+	1o	0+	1o	1-	1o	1-	1o	6o	3-	3-	1o	2-	2-	1o	1o	0o	12-
5	5+	6+	6+	7-	7-	7+	6+	5-	50-	1-	1o	1o	1o	1-	1o	1o	2-	8o	0o	1o	1-	0+	0+	0+	1+	2+	6+
6	5-	5-	3+	4-	1o	1-	1-	1+	20o	1o	1-	1-	1-	0+	1-	0+	1-	5o	3-	2-	2+	1+	1+	1o	3-	3o	16o
7	1o	0+	0+	0+	1o	0+	1o	0+	5-	1+	1-	1-	1o	1+	1-	1-	0+	7-	3o	3-	2+	2o	2o	1o	1o	1+	15+
8	1o	0+	0o	1-	1+	2-	3o	1+	9+	1+	1-	0o	0+	0+	1+	3-	1o	8-	2-	2-	1o	3o	1o	1+	1+	2-	13-
9	3-	1o	0+	1-	1-	1-	0+	1-	7o	0o	0+	0+	1+	0+	0o	1-	0+	3+	3+	4-	5+	4o	4o	3+	3+	3+	30+
10	2o	1+	1o	0+	1-	1-	1-	0+	7o	0o	1+	1+	5-	3-	3+	3+	2+	19o	3+	4o	3+	2o	4o	3-	4-	2-	25-
11	0+	1o	1-	2+	5-	3o	4-	1o	17-	2o	1+	1+	0+	3-	3+	3o	6-	20-	3-	2+	3-	1-	2-	1+	2-	1o	14o
12	1-	1+	1+	3-	4+	5-	3o	3-	21-	6o	8-	7+	7-	5o	4-	5-	6-	47-	4-	3+	3+	3-	2-	1+	2o	3+	21+
13	2-	2-	1+	0+	1o	1+	2o	2-	11o	6o	3+	4+	4-	3+	4+	4-	3+	33+	2+	1+	1-	2+	2o	1+	1o	3-	14-
14	2o	3o	5o	5-	5+	4+	3-	5-	32-	3-	4-	5+	2-	1o	1o	1-	1-	15-	3+	3o	2-	3+	2+	3-	2-	2+	20+
15	4o	5-	3-	3-	3-	2o	2o	3-	21+	1-	1-	1-	0+	1o	3-	1+	2-	9o	2+	1+	1o	1+	1+	1+	1+	3-	13-
16	3-	3+	3+	3+	3+	5-	5+	4o	30o	1+	3-	3+	4-	7+	8-	5-	6-	36+	3-	1+	1o	1+	2+	2-	2o	2-	14o
17	4o	3+	4+	3-	3-	3o	2+	3+	26-	5o	5-	4-	3o	3-	3o	2-	1o	25-	3-	5+	5o	4-	5-	6o	7o	5o	39+
18	3o	3o	2+	2o	2o	3-	2+	2-	19o	1+	1+	1-	2-	2-	2o	1+	2+	12+	3+	3-	1+	2+	2o	2-	1-	0+	14+
19	2+	2o	2+	2-	2-	2+	5o		19o	1o	2-	3-	2o	2+	5-	1+	1-	16+	2+	4-	4+	4+	4+	5+	4+	5o	34-
20	4+	6-	5o	5-	6o	5o	4o	4+	39o	1+	2o	2o	1+	2-	1+	2+	2o	14o	5o	5+	5o	5-	3+	4-	4-	3-	33+
21	3-	2+	0+	5o	7+	4+	3o	3+	28+	1+	1+	1o	2+	2+	1+	1+	4o	15o	3-	3o	2+	3-	2+	2o	3-	2+	20o
22	4+	5-	3o	4-	4-	3+	2+	3-	28-	8-	6-	5-	5o	7+	7o	7+	8-	54+	2+	3-	3-	3+	2+	3+	2o	3-	21+
23	4o	2+	3-	1+	2o	2o	1+	1-	16+	8-	7+	7-	7-	6o	4o	4o	4-	46o	1+	0+	1+	1+	0+	1-	1o	2o	8+
24	2+	1+	2+	1+	3+	2o	3-	2+	18-	4o	2o	3+	3o	3+	2+	1+	2o	21+	2-	3+	2+	2-	2-	0+	1+	1-	13o
25	2+	4o	5-	3o	2o	2-	1+	1-	20-	3+	3+	2o	2+	2+	1+	2-	2o	18+	1o	1+	1+	3o	2+	3-	2+	3o	17o
26	1+	6-	6-	5-	4+	4+	3+	3+	33-	1o	1+	2-	2+	2o	1o	1+	2o	13-	3-	5+	3o	4-	2+	2+	4o	3-	28o
27	3-	3+	3o	2-	3-	3o	2o	3+	22-	3-	2+	1+	2+	3o	2o	2o	2+	18o	1+	1+	1-	0+	0+	1+	3o	2+	11-
28	2o	2-	3+	2+	2-	2+	2o	2+	18-	1o	1o	1+	3-	2-	1+	1o	1+	11+	2+	1o	2-	1-	1o	1o	1o	0o	9-
29	2-	2-	2o	2+	1+	2-	2-	1-	13o	3o	2-	1-	1+	1-	0+	1o	0o	9-	0o	0+	1o	1o	0+	1o	1-	1o	5+
30	1+	3-	1+	1o	0+	1+	0+	0+	9-	0o	1-	1o	1+	2o	3o	2o	2+	12o	1-	1-	2-	3o	1o	1+	3+	3o	15-
31	1+	2o	2+	1o	1+	1o	2-	2o	13-	0+	0+	0o	0+	1-	2-	2-	1o	6o									

	October 1939									November 1939									December 1939								
E	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum
1	3+	2o	1o	1-	2-	3-	2+	2o	16-	2+	2-	2+	3-	2o	2o	3o	1+	17+	2o	3o	4-	2+	2-	1o	2+	2-	18-
2	1-	1o	2-	1-	1o	1+	2-	2o	10o	1+	3-	2o	2-	2-	1o	1+	1-	12+	2-	1+	3-	1+	1-	1+	2+	3-	14o
3	3-	2o	4-	4+	5+	5-	6-	6-	34o	2o	2-	2o	2o	2+	1+	2-	2o	15o	1+	2-	2o	1o	0+	1-	1+	3+	12-
4	7+	7+	4-	3o	4o	3-	3+	2-	33o	3-	1+	2o	2o	1o	1-	1o	1+	12o	3+	3o	2-	0+	1-	0o	0+	1o	9+
5	3-	3-	2o	4-	3+	2o	4+	2o	23-	1+	1-	1+	3o	1+	1+	2-	0+	11o	1o	1o	1-	1-	2+	4-	3+	3+	16o
6	4+	6+	5o	4-	3o	3o	4-	3-	32-	1-	1+	1+	1+	1+	1+	2+	3-	12+	4-	2o	2o	1+	2o	1o	5+	5+	23-
7	2o	1o	1-	2-	3-	4-	5-	4-	20o	2+	2-	2-	2-	1-	2+	2o	1+	14-	6-	6o	5+	4o	5o	5-	4o	4o	39-
8	3+	3o	2-	1-	2-	1+	3o	3-	17+	1-	1-	1o	1o	2o	0+	1+	0+	7+	3+	5-	5-	3+	4-	5+	4o	4-	33-
9	4-	3o	7-	3+	5+	3-	3o	1+	29o	1-	2+	2o	2-	1-	1o	1-	1-	10-	4+	2+	3+	3+	4-	3o	4-	2-	25+
10	1-	1o	1+	1+	2o	1o	0+	2+	10o	1o	2o	1-	1-	1-	1o	1+	1-	8o	2-	2+	2o	2o	3o	2+	2o	3-	18o
11	3-	3o	1+	2-	2+	1o	3-	3+	19-	2-	2+	1-	1-	0+	1o	2o	2+	11o	3o	2o	3-	2o	2-	1o	1+	2-	15+
12	3o	2-	1-	0+	0+	1-	0+	1-	8-	4-	1+	1-	3+	3o	2+	2-	2o	18o	3-	2-	1+	2-	1o	3-	2+	3+	17-
13	5o	6-	6+	4o	4-	6-	8-	8o	46o	4o	5+	5o	5+	4o	5-	4+		38o	2+	3-	2o	1+	2o	2-	0o	0o	12o
14	5+	6o	7-	7-	6o	6o	5o	4-	45+	5-	4o	3o	3o	3-	3o	3-	4o	27o	2o	0+	1+	1-	1-	1-	0+	1-	7-
15	7-	8o	7-	3+	3+	5-	4o	3o	40-	3o	2+	3-	2-	2o	3o	3-	1o	18+	2o	3-	2+	1+	2-	3-	2o	2o	17-
16	4-	4o	4o	3o	4+	6-	5o	5-	34+	2o	1o	1+	1-	1o	2-	1+	1-	10-	1+	2-	1-	1o	1o	3-	1+	3-	14+
17	4o	5+	5-	4o	4-	5o	5o	4-	35+	1-	0+	1+	1+	1o	1o	2o	1+	9o	3o	1+	2-	2-	1-	1o	1o	1o	11+
18	4o	4-	4o	4o	4-	4+	5-	4-	32o	1-	1+	2o	2-	1-	1+	1-	1-	8+	2-	1o	1-	0+	0o	0+	0o	0+	4+
19	4o	5-	4o	5-	3-	3o	4-	2+	29o	0+	0+	0+	2o	3o	3+	3o	2o	14+	0o	1+	0+	0+	0o	0+	0o	0o	2o
20	2+	2-	2+	2+	0+	1-	1-	0o	10+	3+	3-	2o	1o	0+	0+	2-	2-	13o	0+	0o	0+	0o	1-	1o	2o	2-	6o
21	0+	2+	3o	2o	3o	2o	3+	4-	20-	1o	1+	2o	2o	2o	1-	1-	0o	10-	2o	3o	4+	4-	4o	3+	3o	3o	26+
22	2+	1+	2o	1-	1o	1o	3+	3-	14+	0o	0+	0+	0o	0+	0+	0o	1o	2+	5-	4-	4-	3-	5-	4o	3+	3+	30o
23	0+	2o	3o	3o	4o	4+	2+	3-	22-	0+	1o	1+	1o	1-	0+	1-	1-	6o	2o	4-	3o	3-	1+	2-	1+	3-	18+
24	4-	2+	2o	1o	1-	1-	1+	1-	12+	1-	1+	0+	1-	3-	2-	3-	3+	13+	3o	3o	3o	3-	2+	2+	2+	3-	21+
25	2-	2o	2o	1+	2+	1-	1-	0o	11-	3+	5-	4o	3-	3-	3o	4o	5o	29+	3+	3-	2o	1+	2o	1o	2-	2o	16o
26	1-	1-	2o	1+	1-	1-	3o	2o	11o	3+	4-	3+	4-	3o	2o	3+	2o	24+	2-	3-	2o	2-	1o	0+	1o	1+	12-
27	1-	1o	1-	1o	1o	2o	0+	1-	7+	1+	3+	2o	2+	2-	1+	2o	1o	15o	2-	3o	3-	3o	2+	3o	4-	2o	21+
28	0+	1o	2+	3o	3-	1o	2o	3-	15o	1-	3o	2-	2o	2+	1o	2-	0+	13-	2o	2o	2o	2+	2+	2o	3o	3-	18+
29	3+	3+	2+	2-	2-	1+	2+	1+	17+	1+	1+	2-	2+	2-	2o	1+	2+	14-	3+	3-	2o	2+	2o	3o	3-	2+	20+
30	3o	2+	1+	1+	2o	2-	2-	2+	16-	1-	3-	2-	1+	1+	1+	2-	2o	13-	3o	2o	1+	2-	1+	2+	1o	1o	14-
31	3o	2o	2o	1+	2o	1+	1+	1-	14-										1o	2o	1o	1o	1-	0o	0+	0o	6o

Table 86

Sudden Ionosphere Disturbances Observed at Washington, D. C.

July 1953

No sudden ionosphere disturbances were observed during the month of July.

Note: Observers are invited to send to the CRPL information on times of beginning and end of sudden ionosphere disturbances for publication as above. Address letters to the Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D. C.

GRAPHS OF IONOSPHERIC DATA

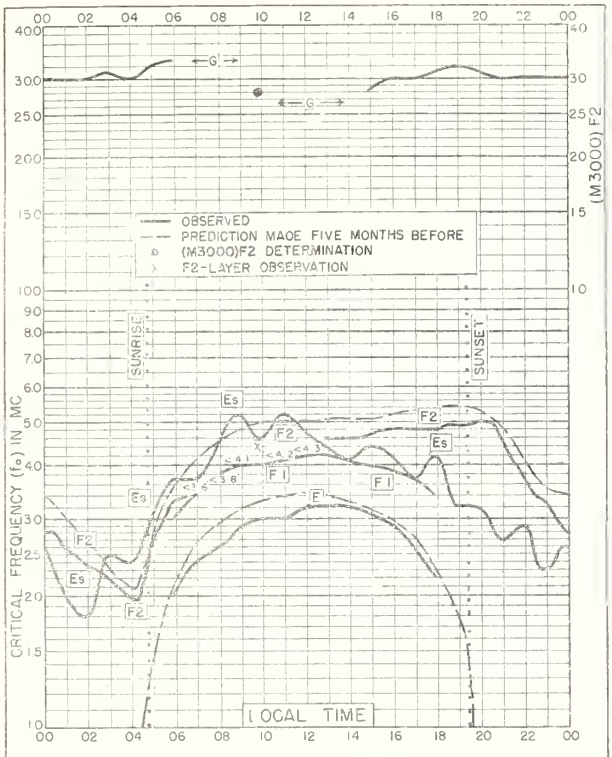


Fig. 1. WASHINGTON, D. C.
38.7°N, 77.1°W JULY 1953

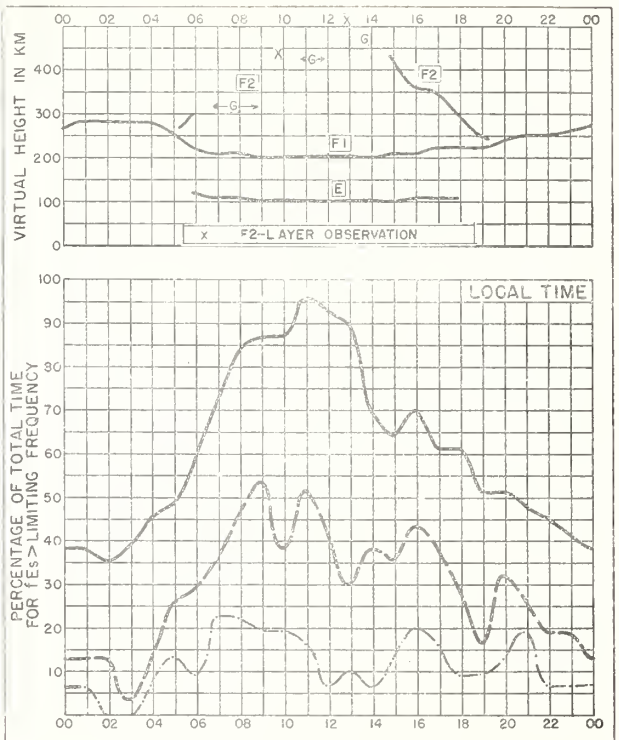


Fig. 2. WASHINGTON, D. C. JULY 1953

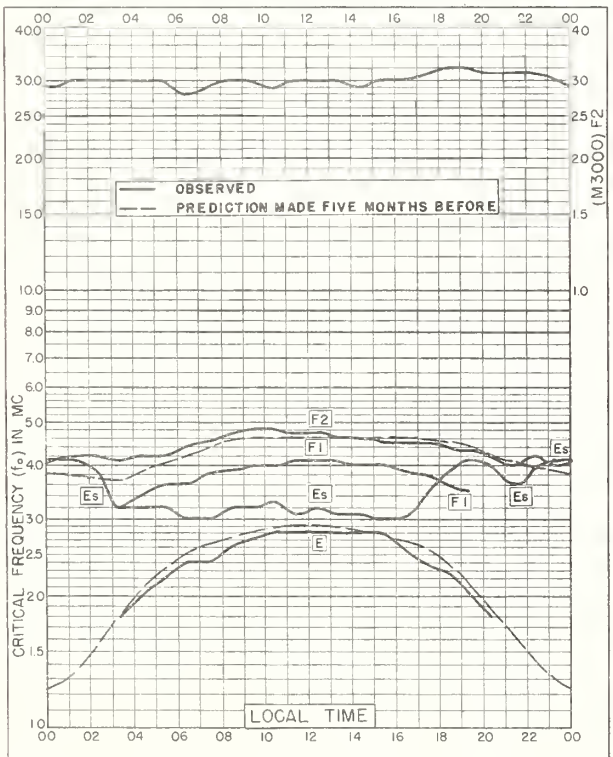


Fig. 3. TROMSO, NORWAY
69.7°N, 19.0°E JUNE 1953

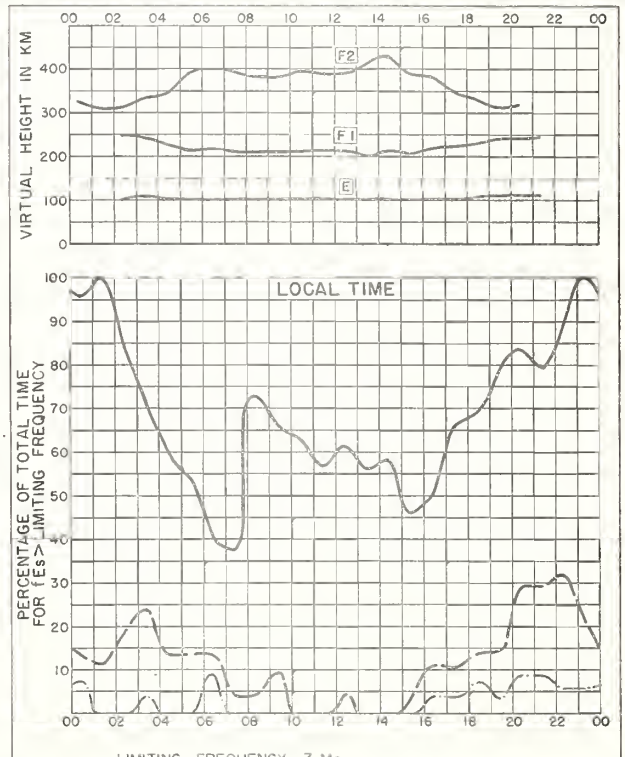


Fig. 4. TROMSO, NORWAY JUNE 1953

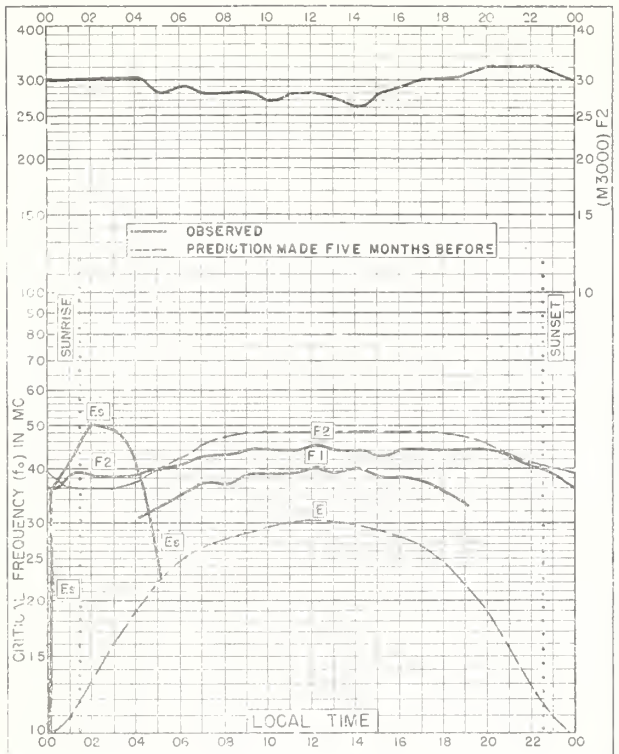


Fig. 5. FAIRBANKS, ALASKA
64.9°N, 147.8°W JUNE 1953

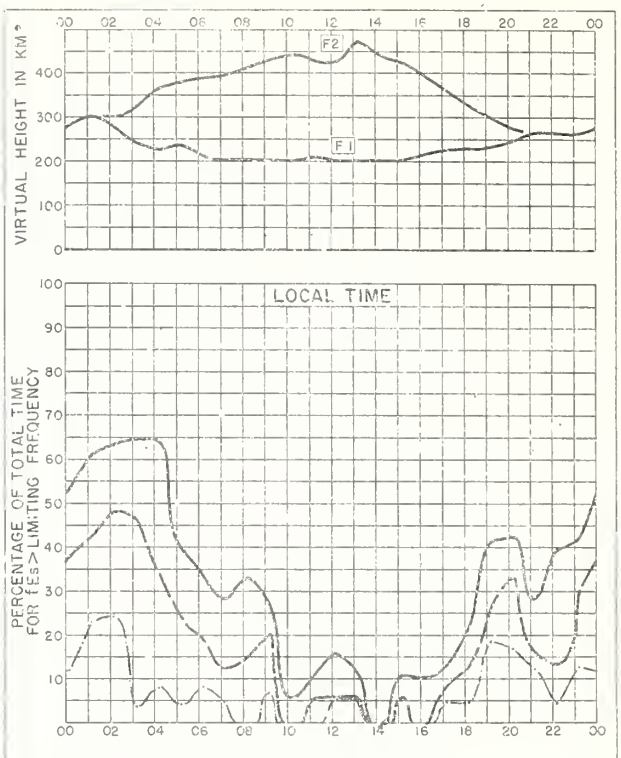


Fig. 6. FAIRBANKS, ALASKA JUNE 1953

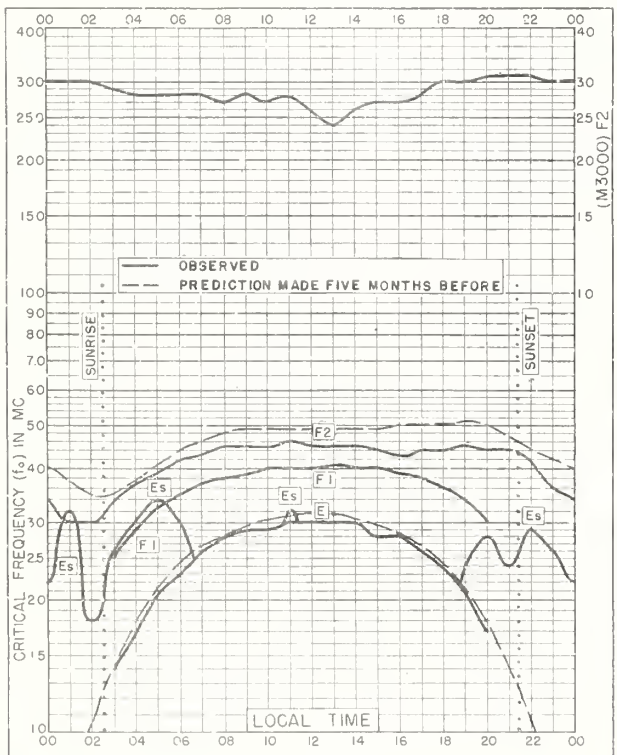


Fig. 7. ANCHORAGE, ALASKA
61.2°N, 149.9°W JUNE 1953

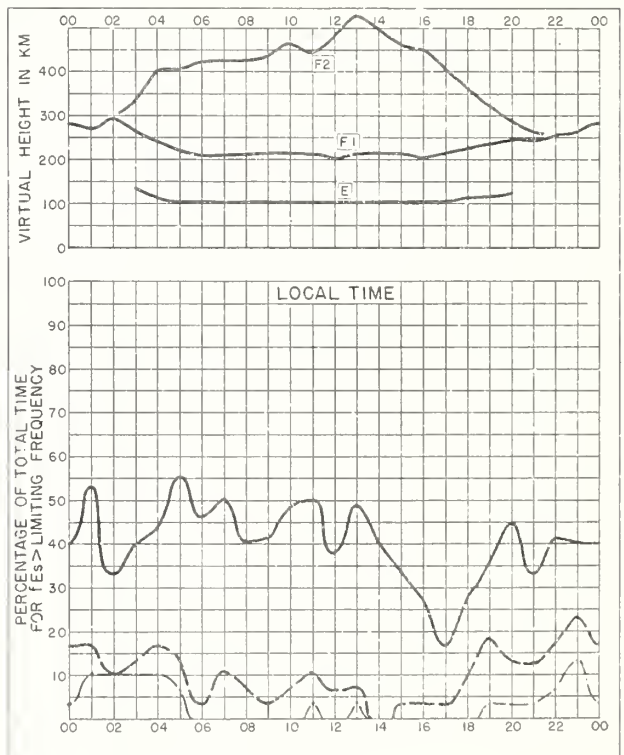


Fig. 8. ANCHORAGE, ALASKA JUNE 1953

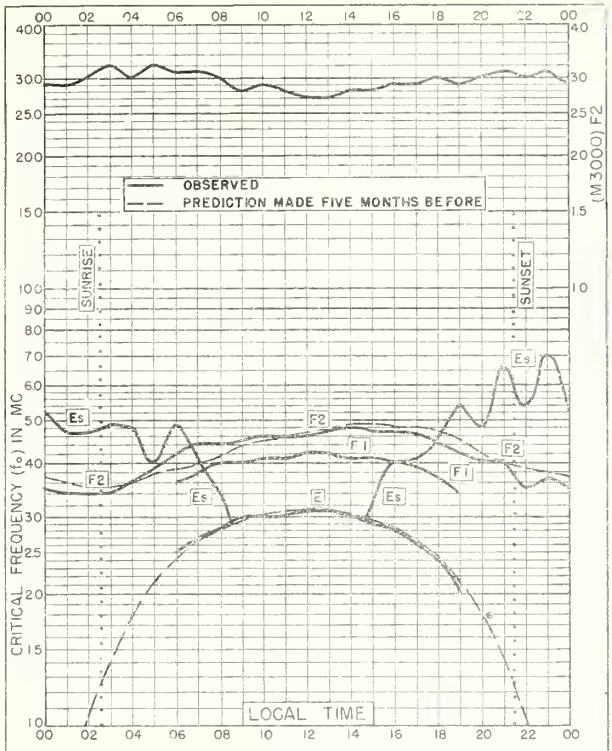


Fig. 9. NARSARSSUAK, GREENLAND
61.2°N, 45.4°W JUNE 1953

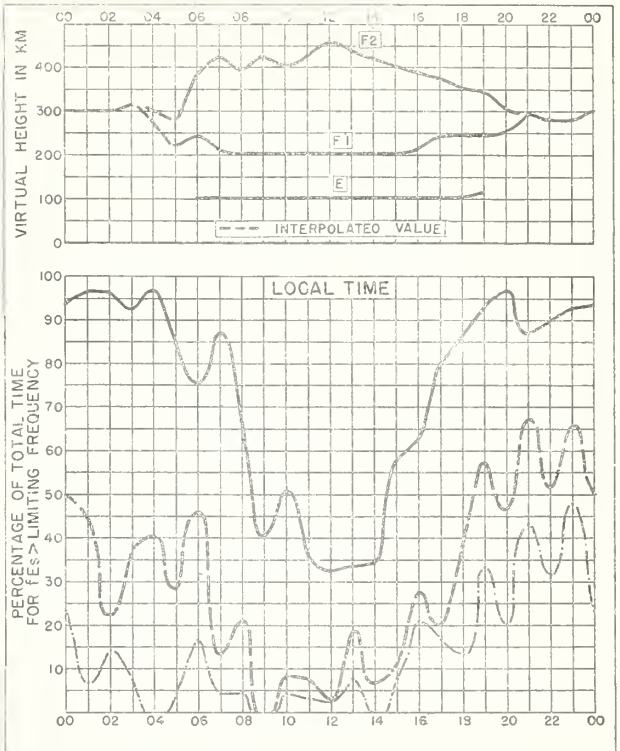


Fig. 10. NARSARSSUAK, GREENLAND JUNE 1953

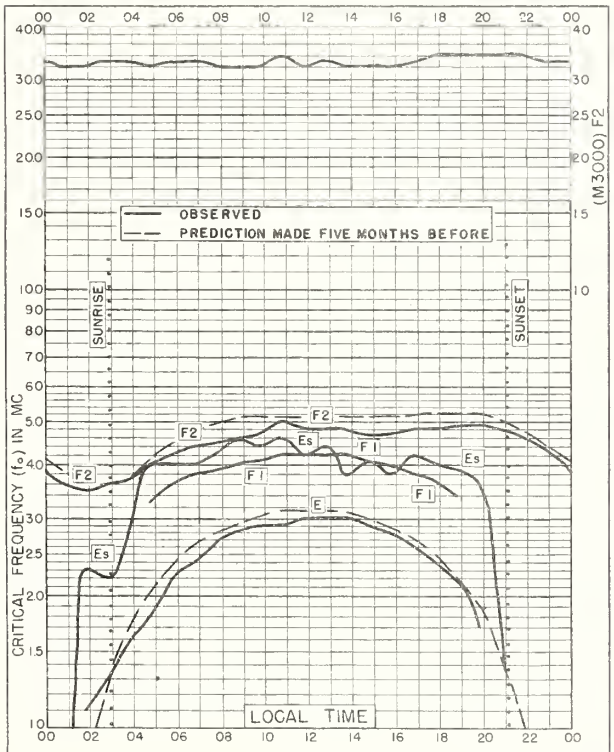


Fig. 11. OSLO, NORWAY
60.0°N, 11.1°E JUNE 1953

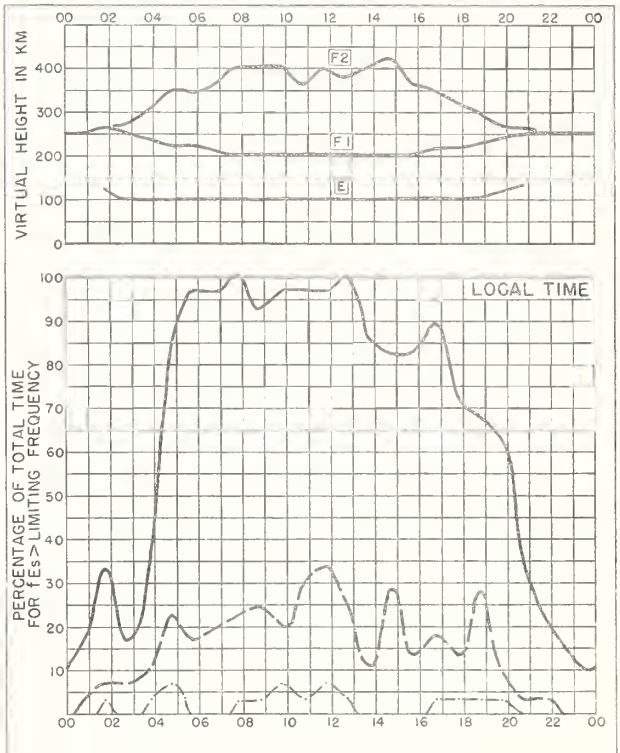


Fig. 12. OSLO, NORWAY JUNE 1953

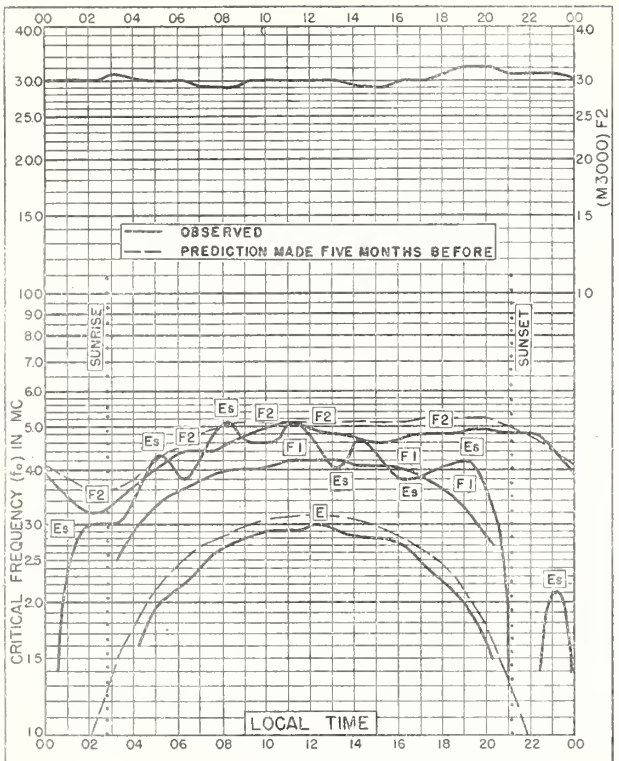


Fig. 13. UPSALA, SWEDEN
59.8°N, 17.6°E JUNE 1953

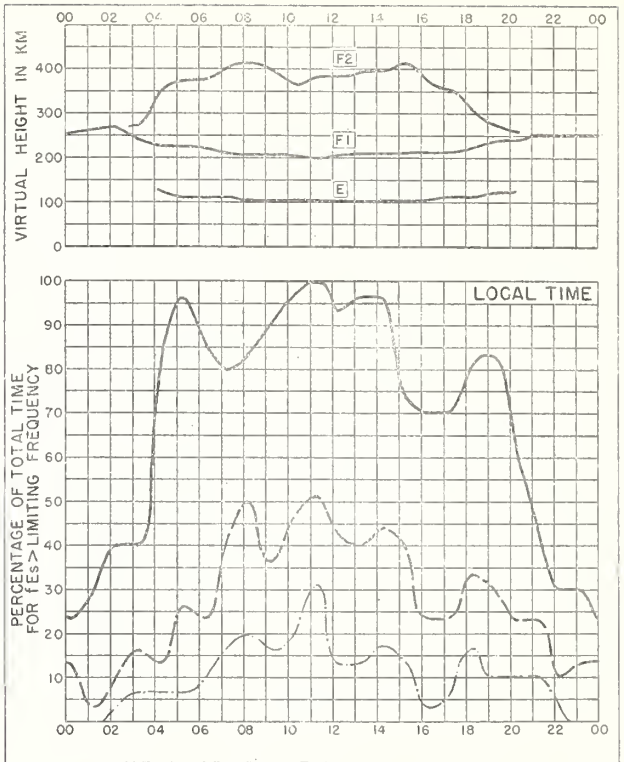


Fig. 14. UPSALA, SWEDEN JUNE 1953

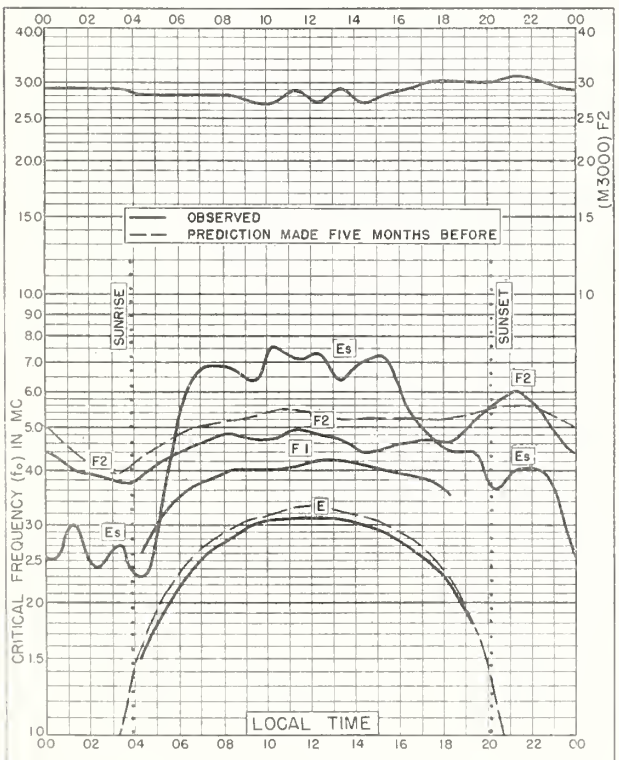


Fig. 15. ADAK, ALASKA
51.9°N, 176.6°W JUNE 1953

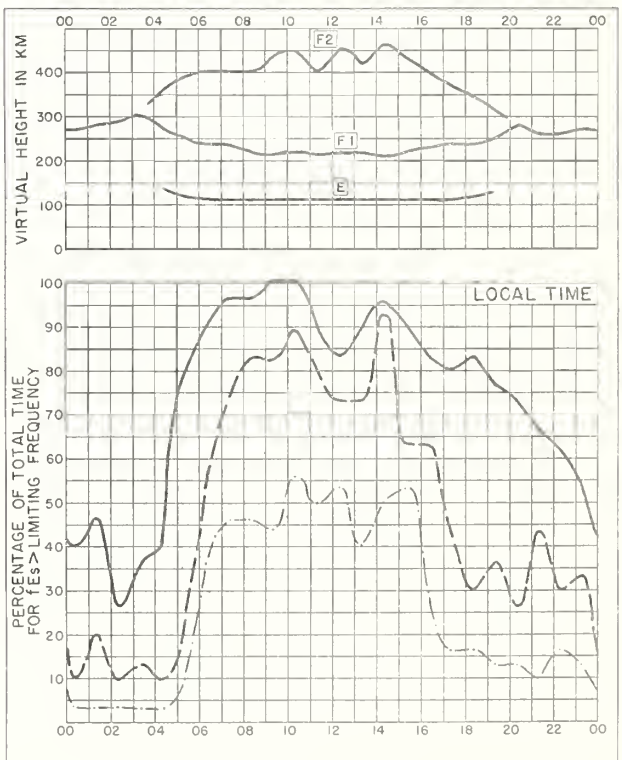


Fig. 16. ADAK, ALASKA JUNE 1953

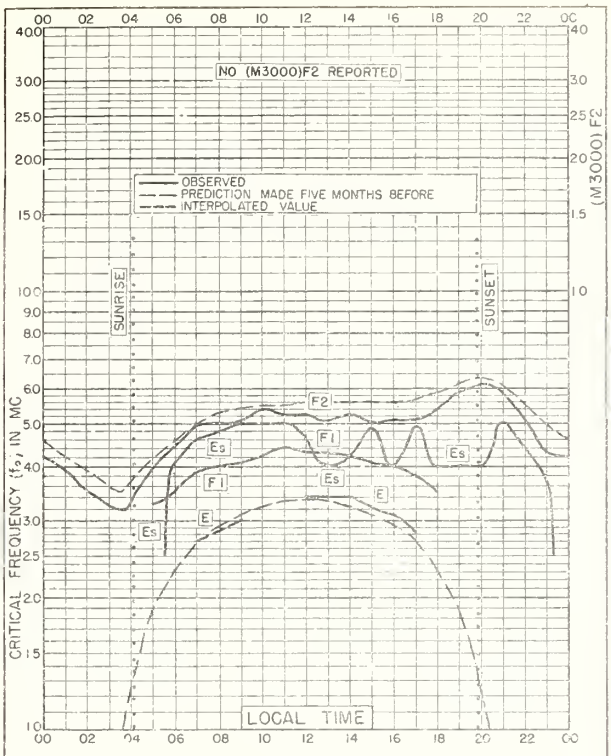


Fig. 17. GRAZ, AUSTRIA
47.1°N, 15.5°E JUNE 1953

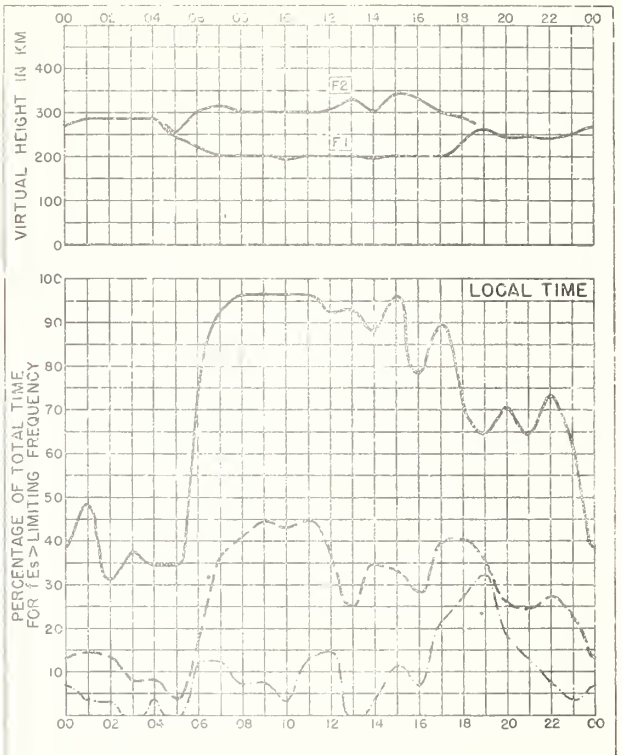


Fig. 18. GRAZ, AUSTRIA JUNE 1953

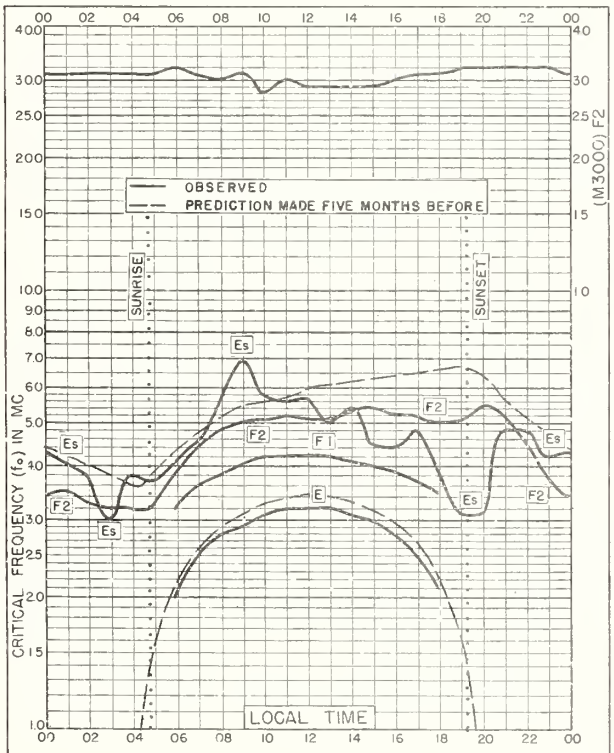


Fig. 19. SAN FRANCISCO, CALIFORNIA
37.4°N, 122.2°W JUNE 1953

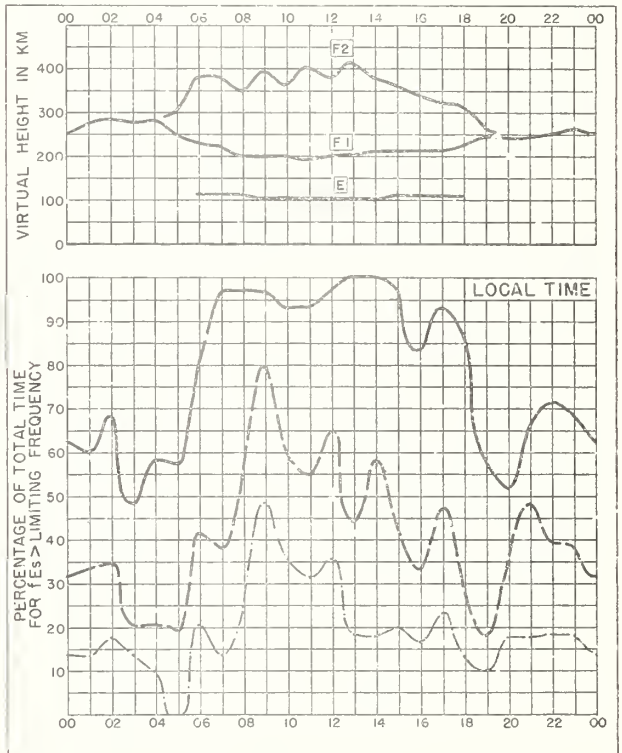


Fig. 20. SAN FRANCISCO, CALIFORNIA JUNE 1953

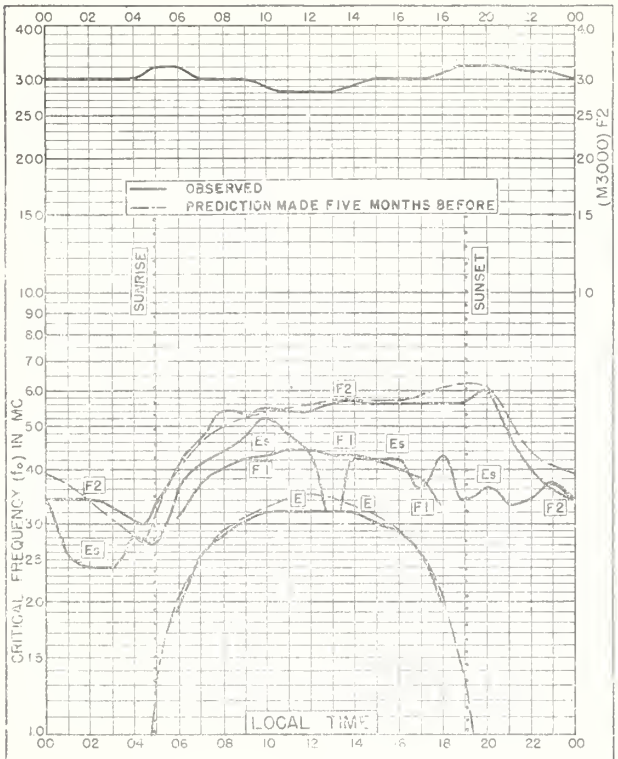


Fig. 21. WHITE SANDS, NEW MEXICO
32.3°N, 106.5°W JUNE 1953

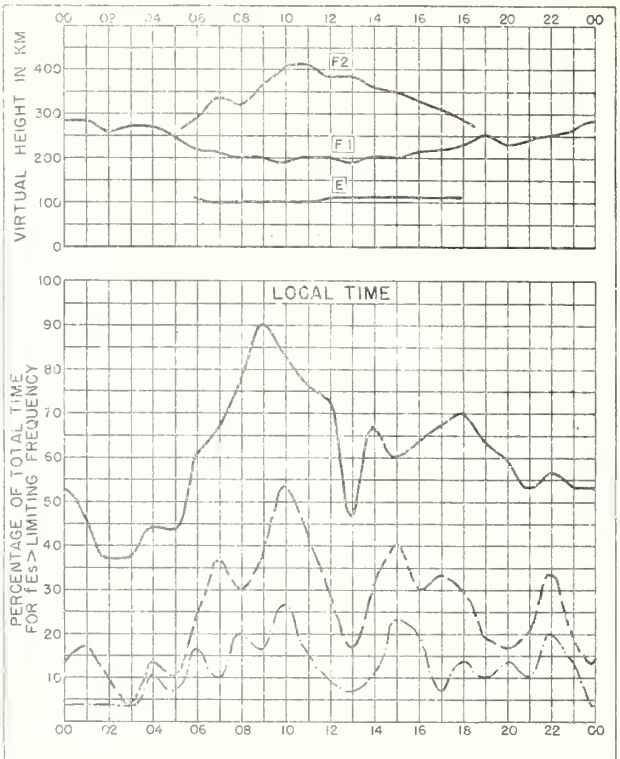


Fig. 22. WHITE SANDS, NEW MEXICO JUNE 1953

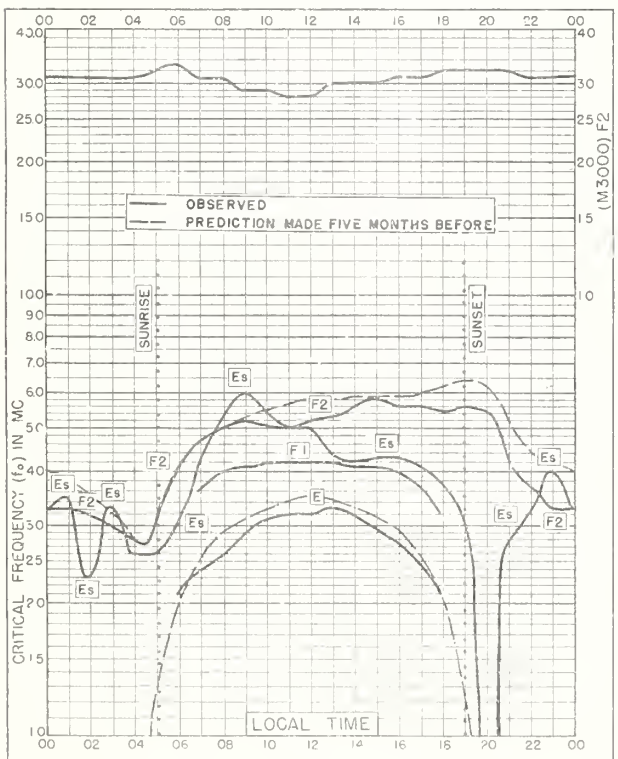


Fig. 23. BATON ROUGE, LOUISIANA
30.5°N, 91.2°W JUNE 1953

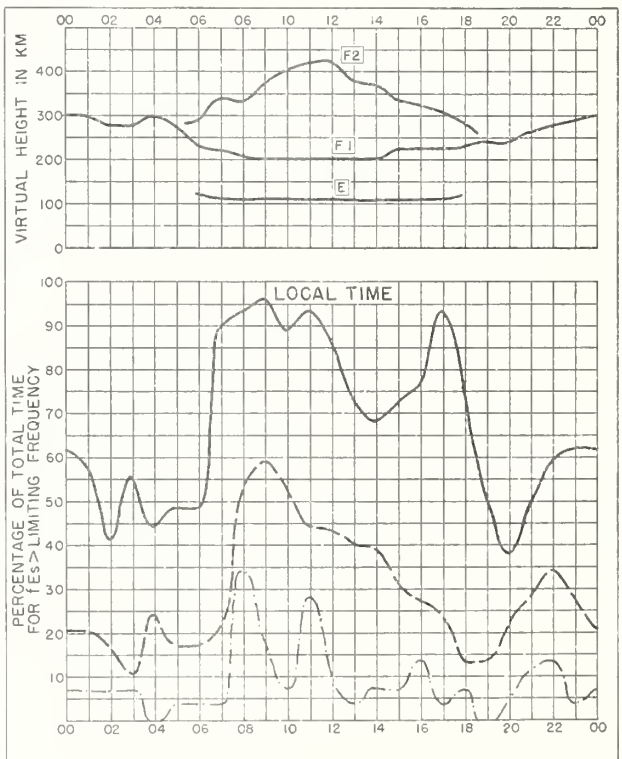


Fig. 24. BATON ROUGE, LOUISIANA JUNE 1953

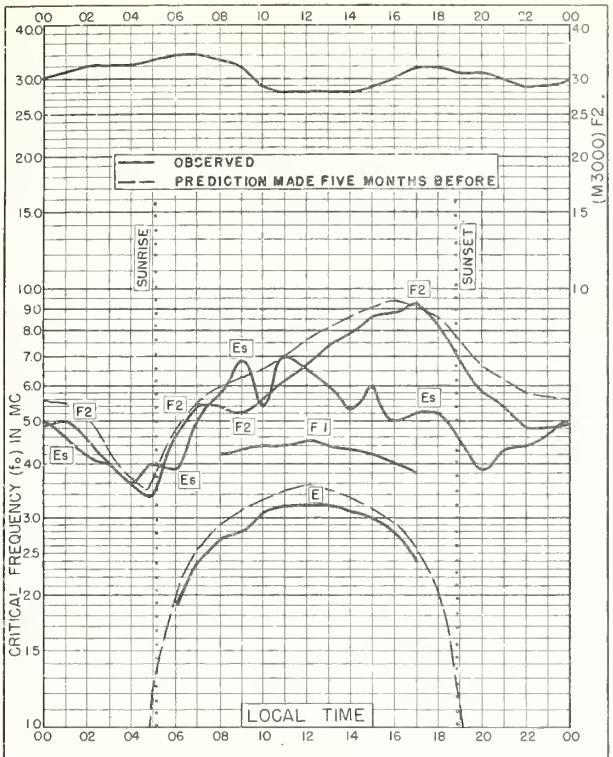


Fig. 25 OKINAWA I.
26.3°N, 127.8°E JUNE 1953

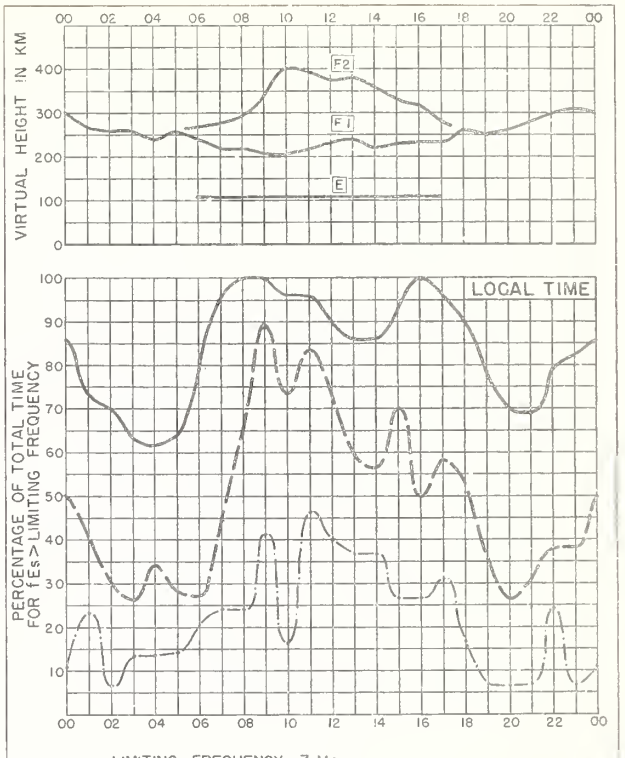


Fig. 26. OKINAWA I. JUNE 1953

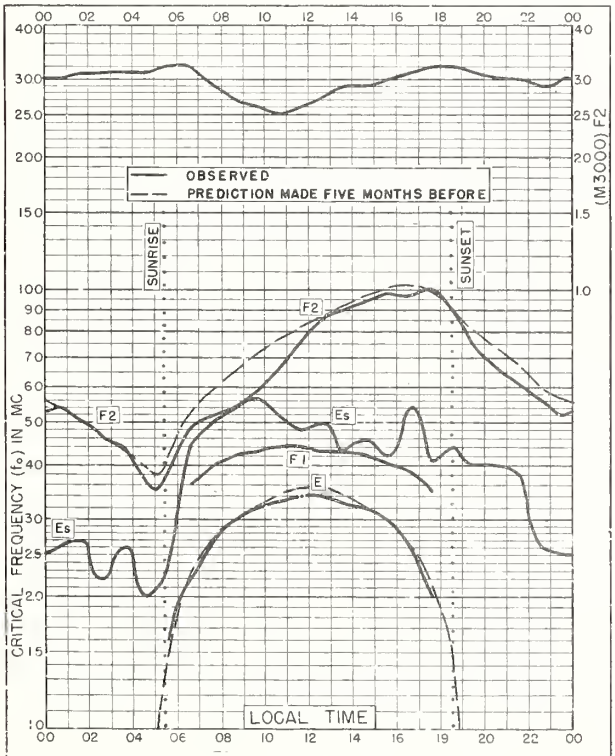


Fig. 27. MAUI, HAWAII
20.8°N, 156.5°W JUNE 1953

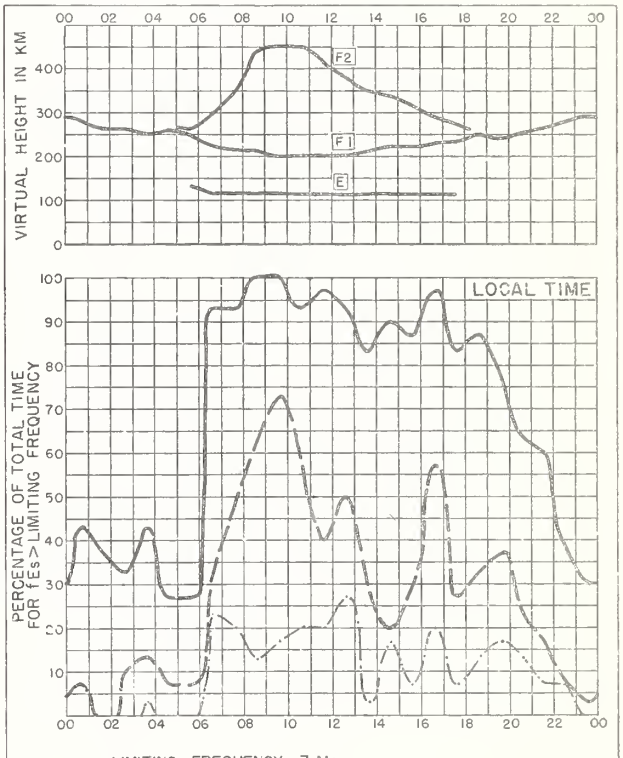


Fig. 28. MAUI, HAWAII JUNE 1953

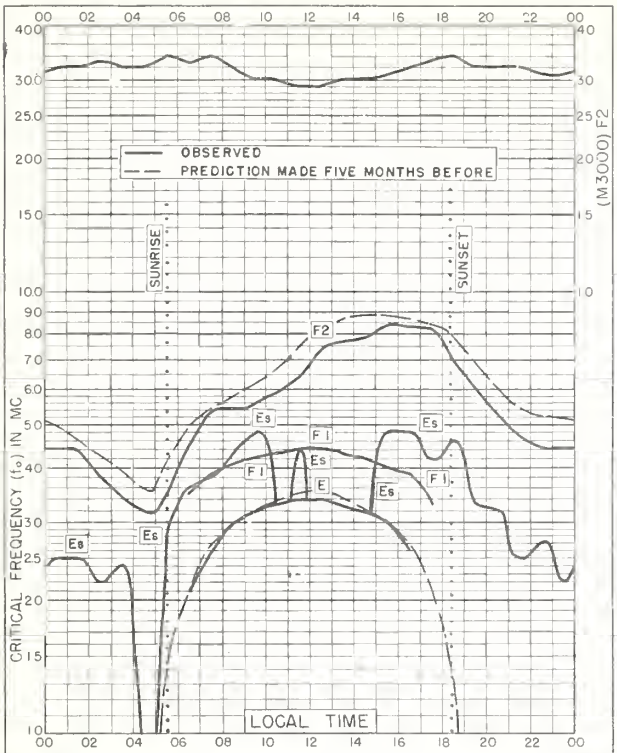


Fig. 29. PUERTO RICO, W. I.
18.5°N, 67.2°W JUNE 1953

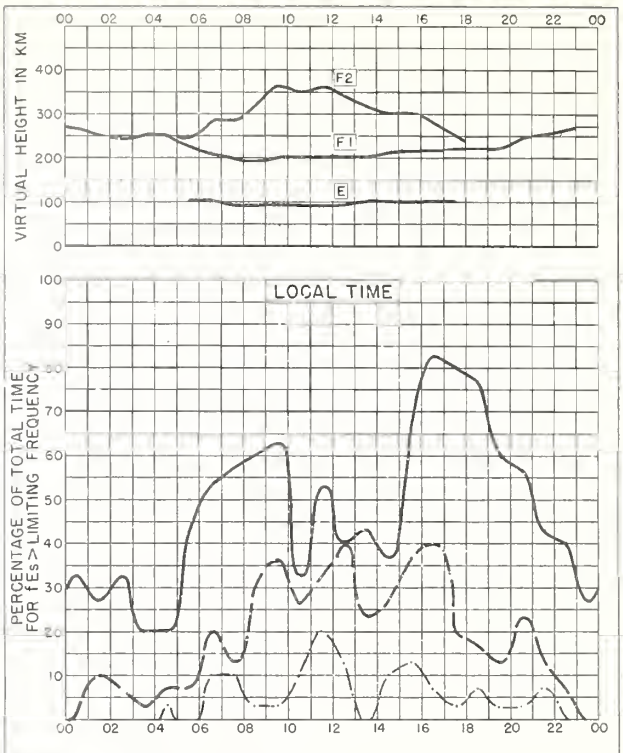


Fig. 30. PUERTO RICO, W. I. JUNE 1953

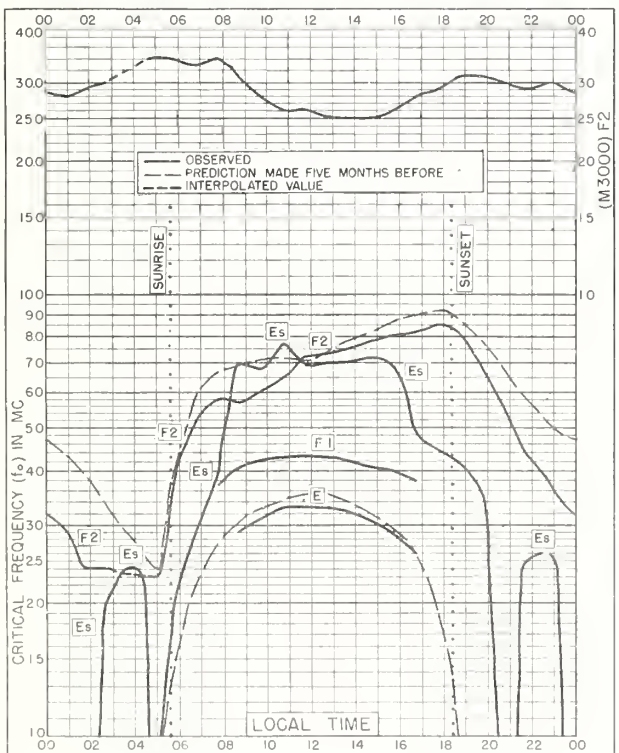


Fig. 31. GUAM I.
13.6°N, 144.9°E JUNE 1953

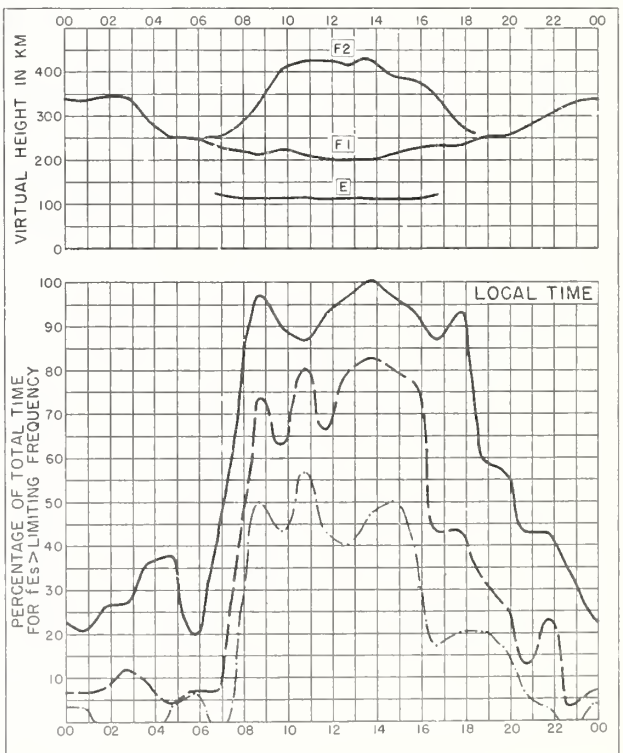


Fig. 32. GUAM I. JUNE 1953

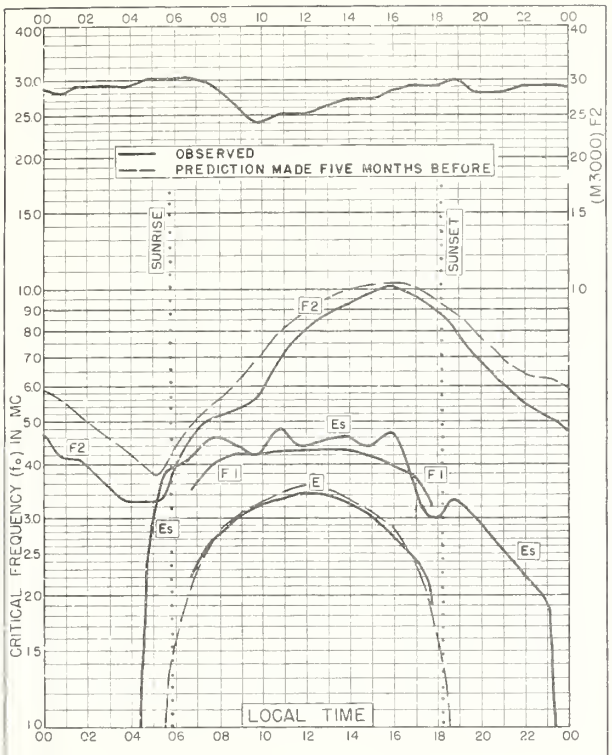


Fig. 33. PANAMA CANAL ZONE
9.4° N, 79.9° W JUNE 1953

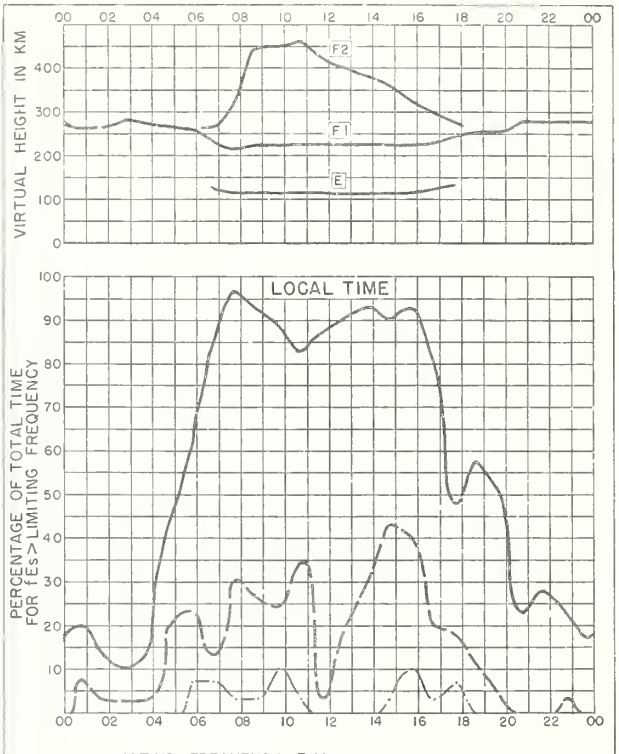


Fig. 34. PANAMA CANAL ZONE JUNE 1953

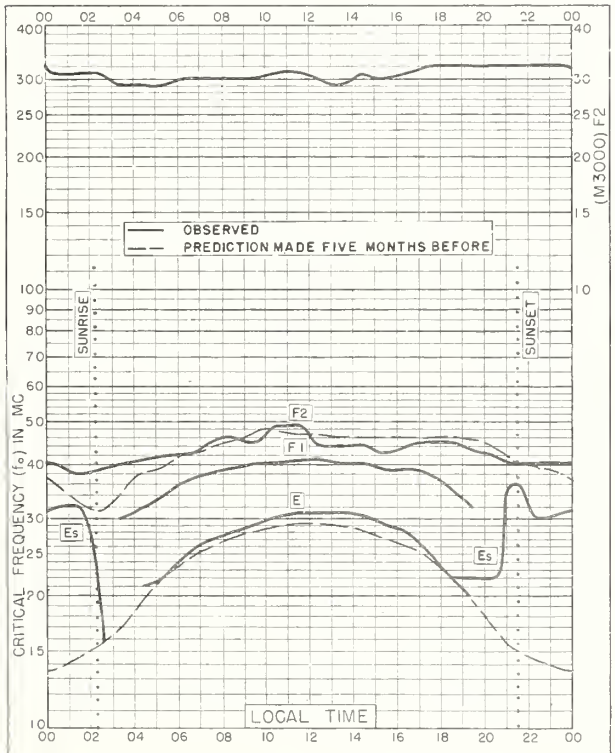


Fig. 35. KIRUNA, SWEDEN
67.8° N, 20.5° E MAY 1953

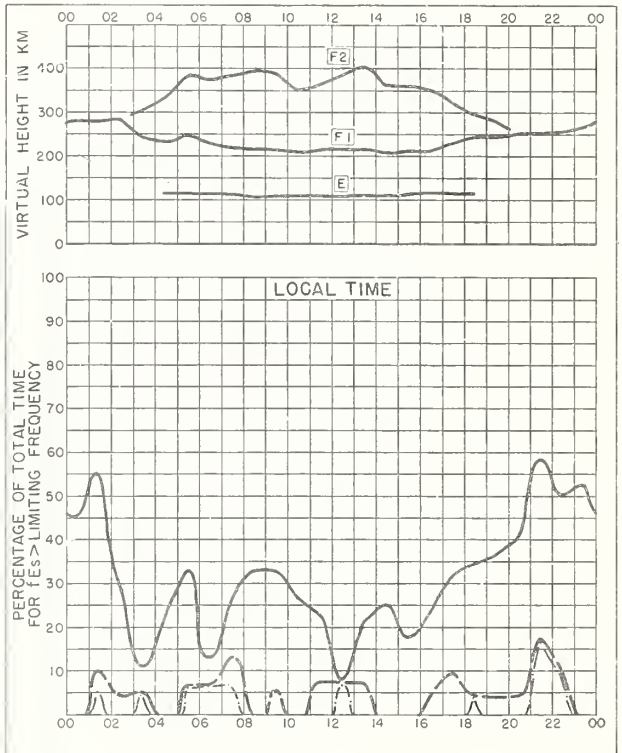


Fig. 36. KIRUNA, SWEDEN MAY 1953

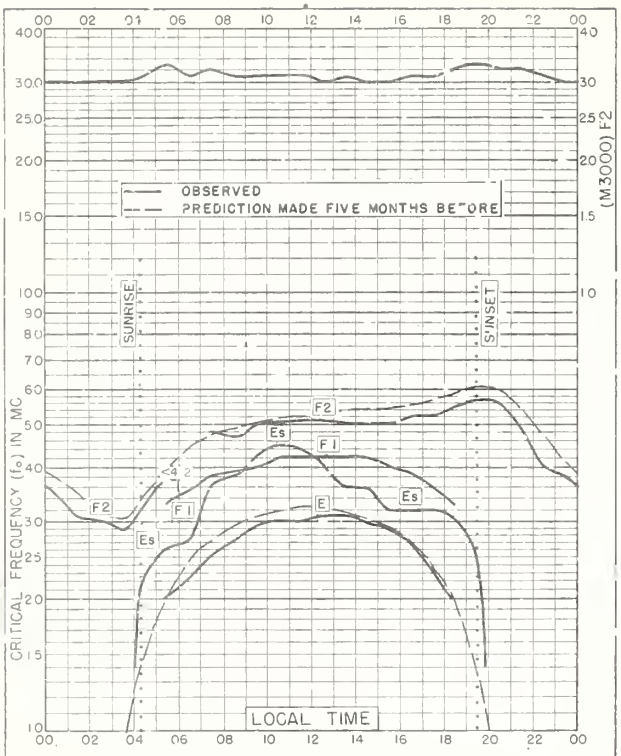


Fig. 37. DE BILT, HOLLAND
52.1°N, 5.2°E MAY 1953

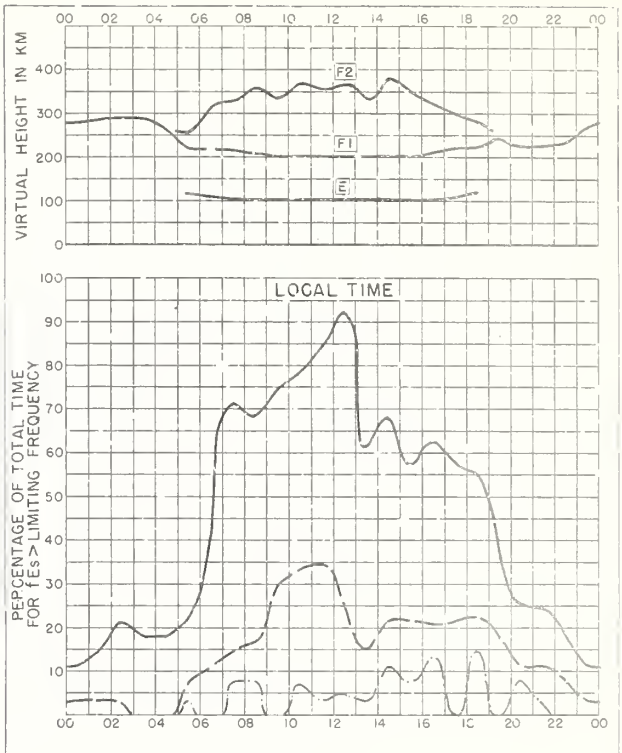


Fig. 38. De BILT, HOLLAND MAY 1953

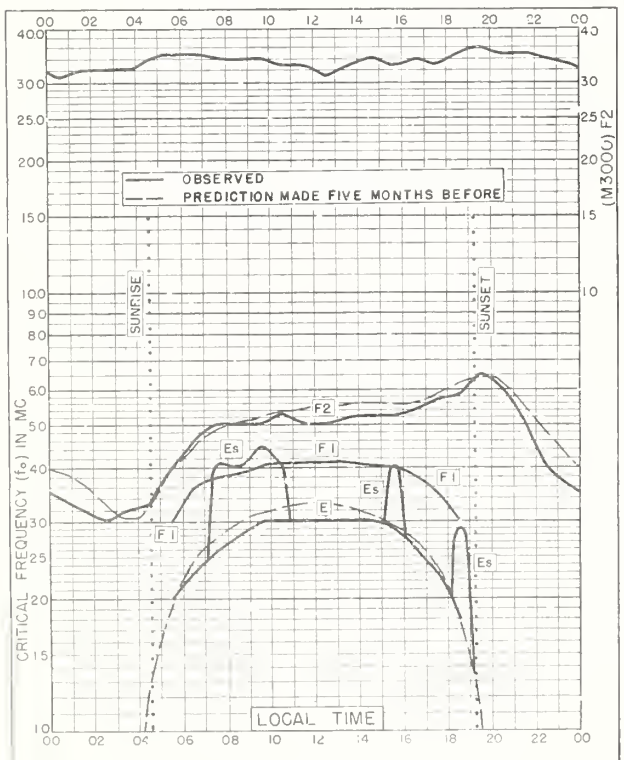


Fig 39. SCHWARZENBURG, SWITZERLAND
46.8°N, 7.3°E MAY 1953

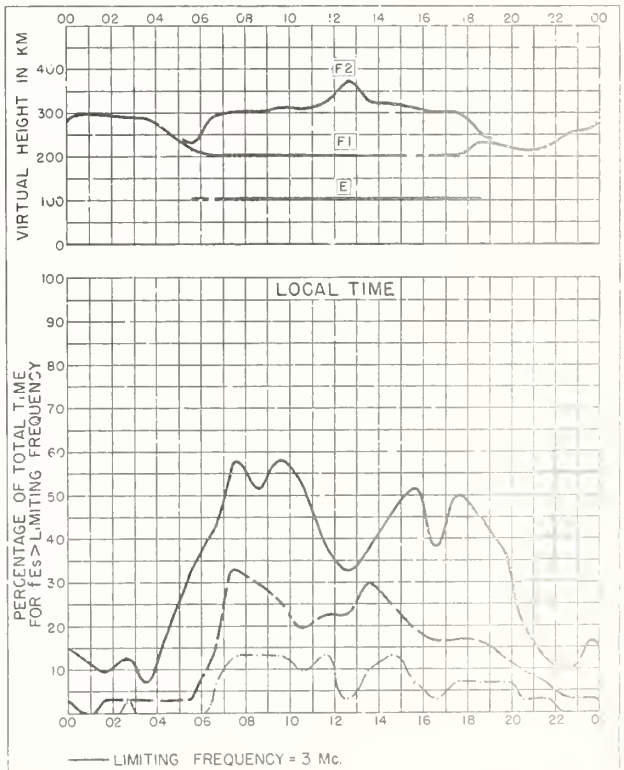


Fig. 40. SCHWARZENBURG, SWITZERLAND MAY 1953

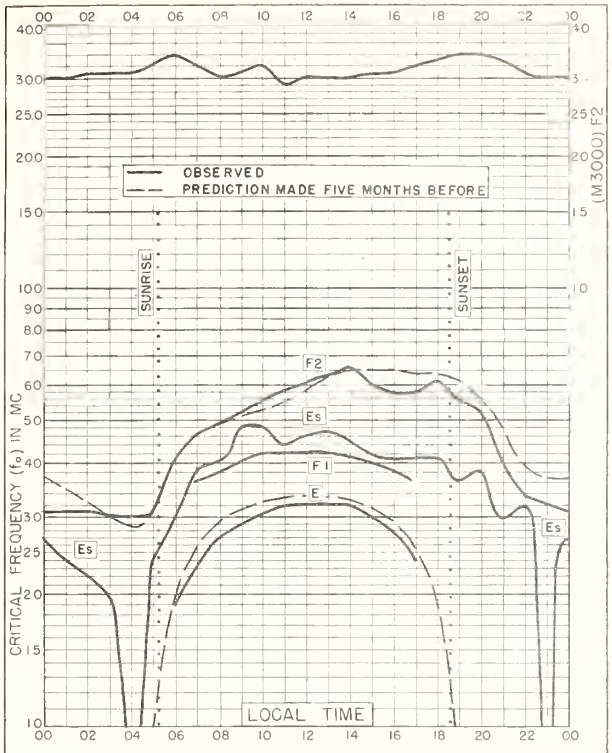


Fig. 41. BATON ROUGE, LOUISIANA
30.5°N, 91.2°W MAY 1953

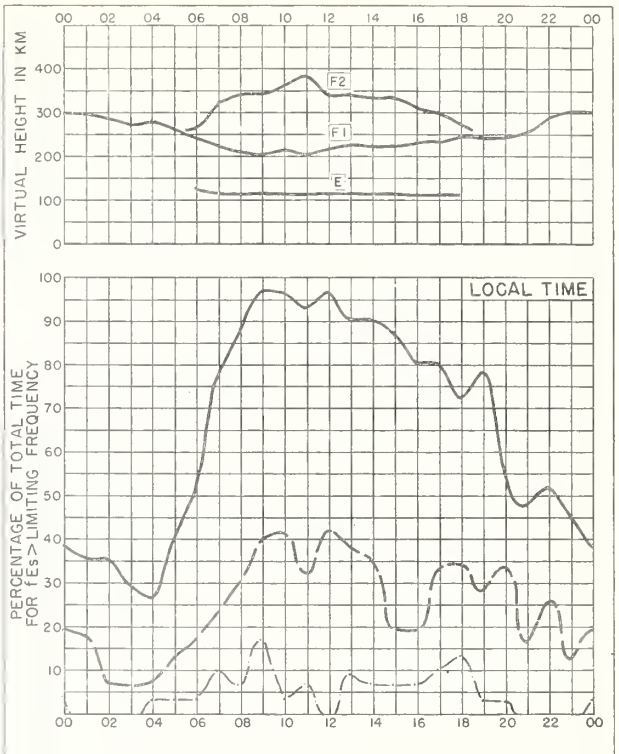


Fig. 42. BATON ROUGE, LOUISIANA MAY 1953

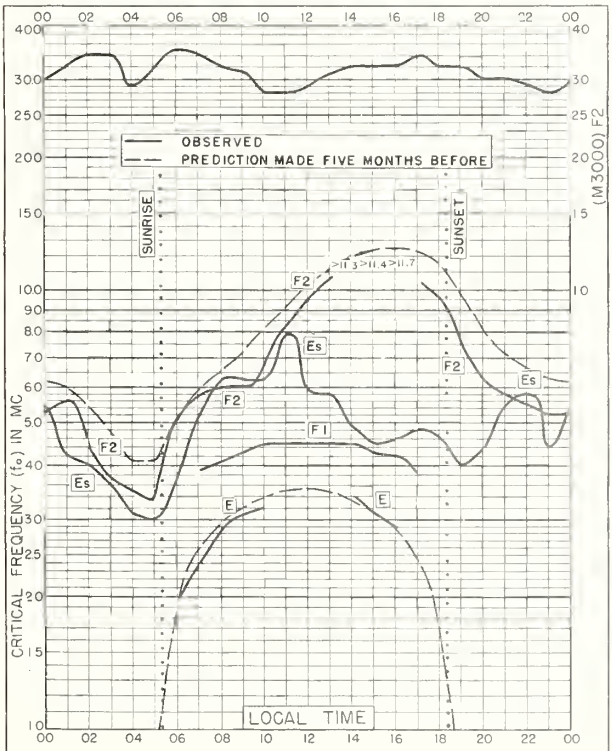


Fig. 43. FORMOSA, CHINA
25.0°N, 121.5°E MAY 1953

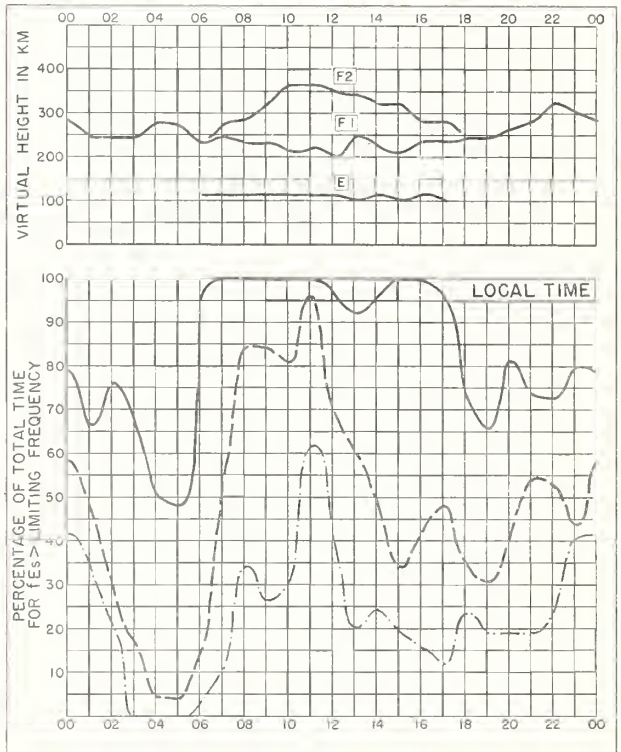


Fig. 44. FORMOSA, CHINA MAY 1953

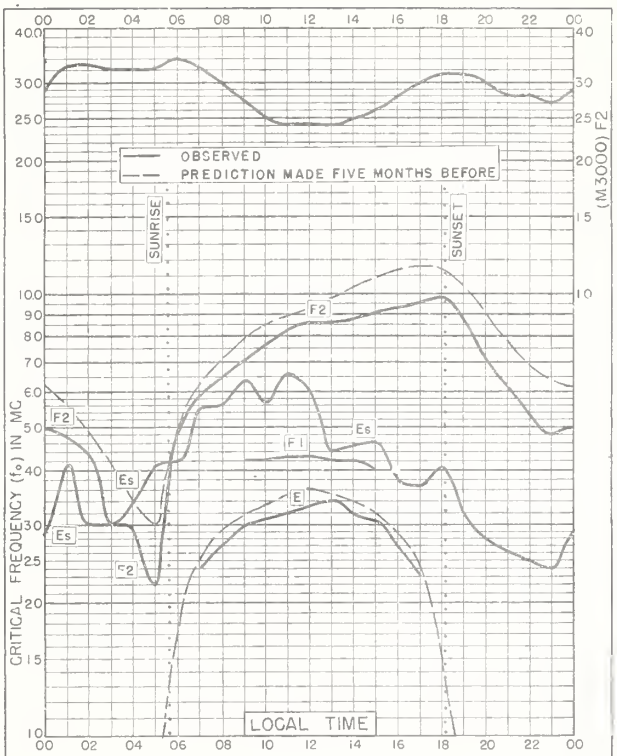


Fig. 45. BAGUIO, P. I.
16.4°N, 120.6°E MAY 1953

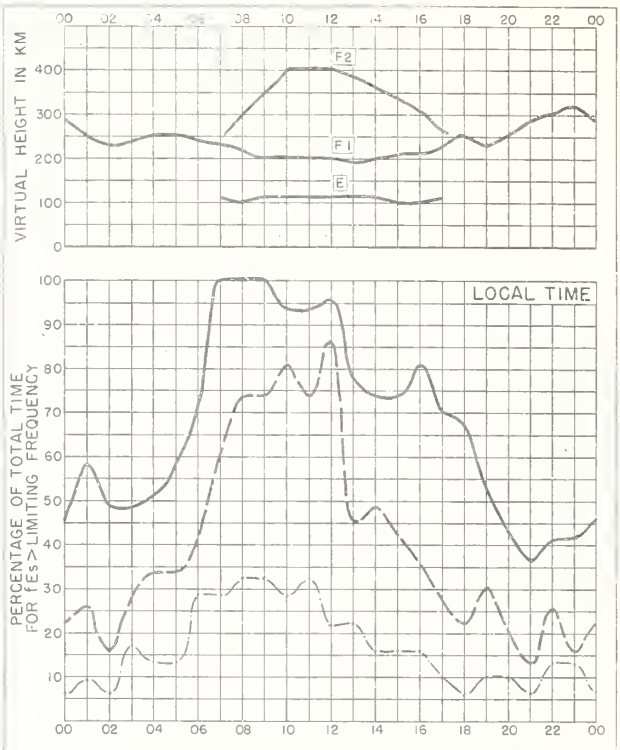


Fig. 46. BAGUIO, P. I. MAY 1953

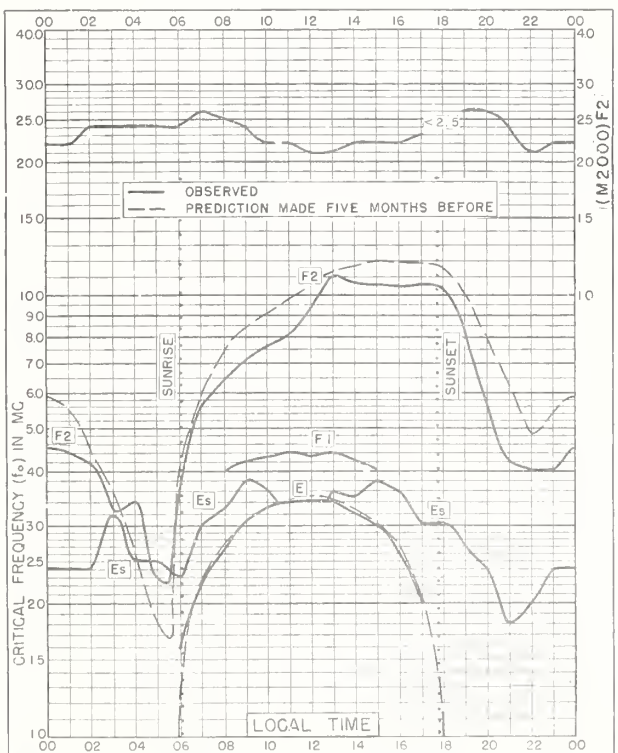
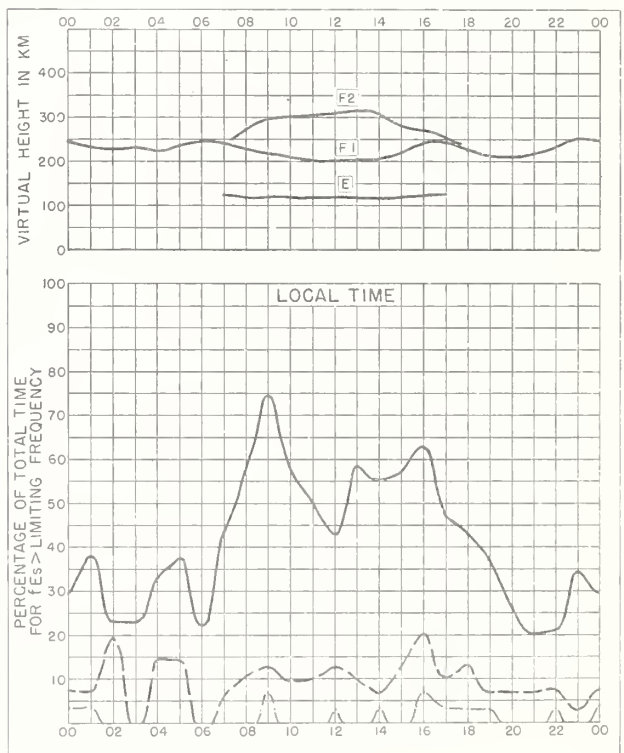


Fig. 47. LEOPOLDVILLE, BELGIAN CONGO
4 3°S, 15.3°E MAY 1953



MAY 1953
Fig 48. LEOPOLDVILLE, BELGIAN CONGO

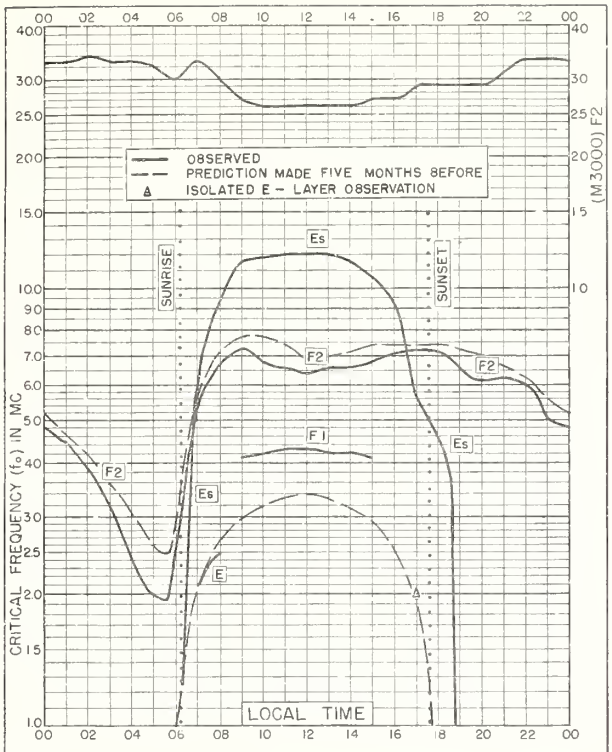


Fig. 49. HUANCAYO, PERU
12.0°S, 75.3°W MAY 1953

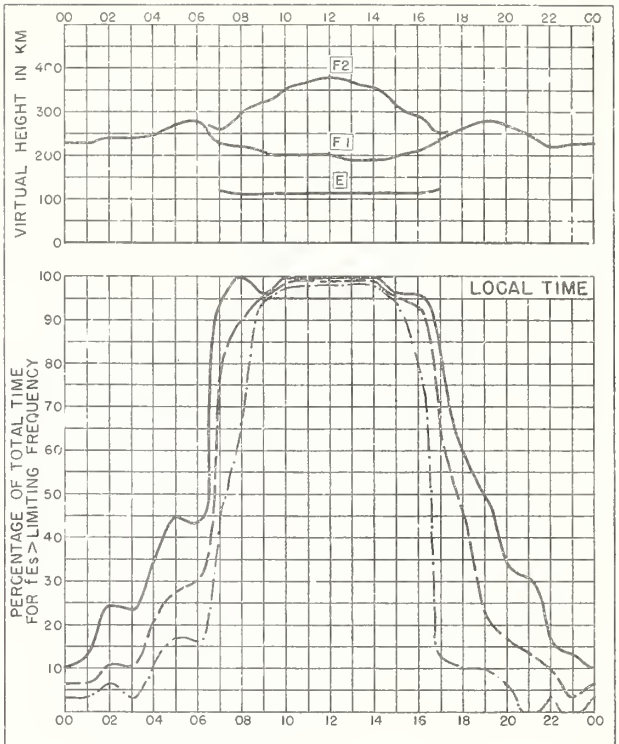


Fig. 50. HUANCAYO, PERU MAY 1953

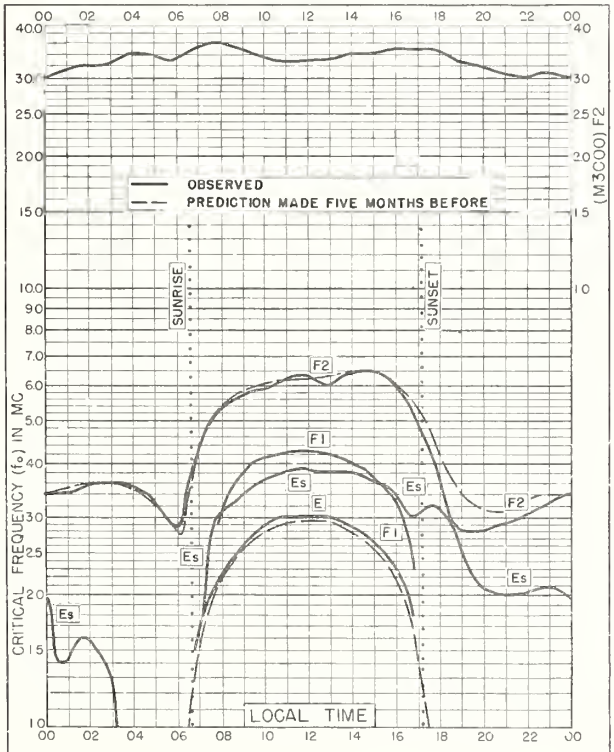


Fig. 51. WATHEROO, W. AUSTRALIA
30.3°S, 115.9°E MAY 1953

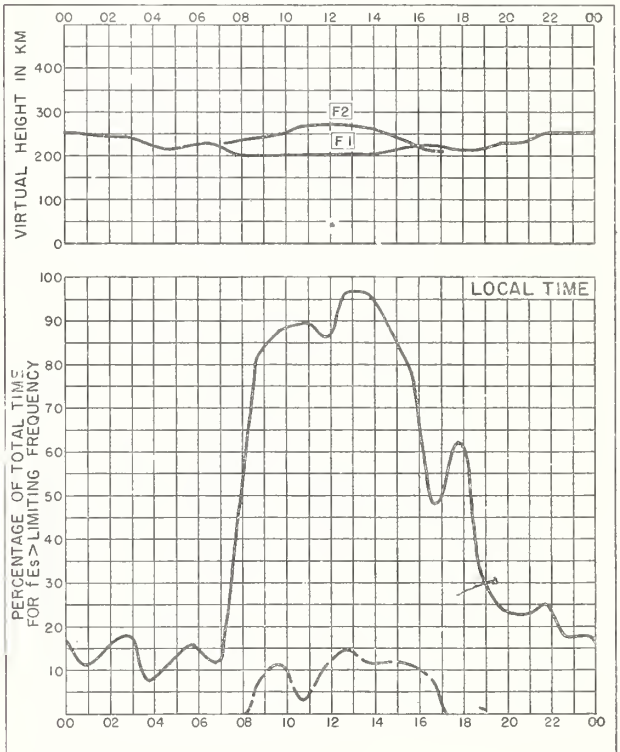


Fig. 52. WATHEROO, W. AUSTRALIA MAY 1953

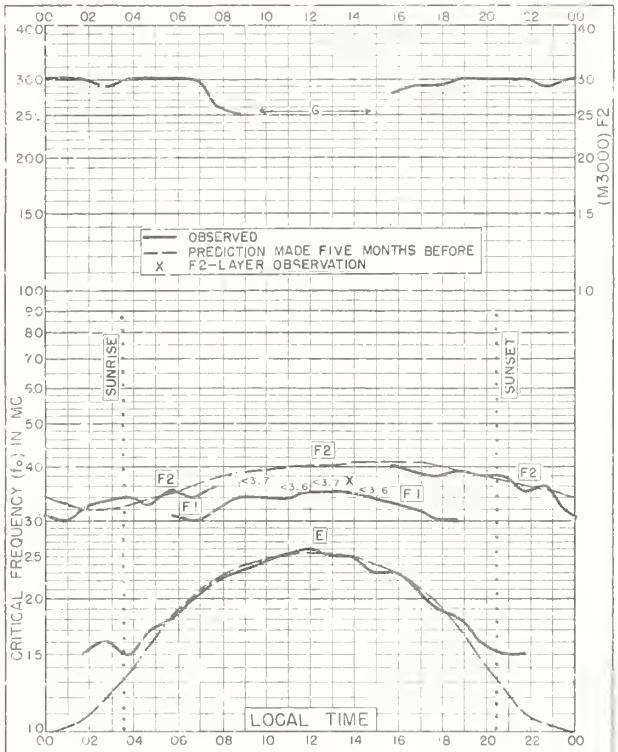


Fig. 53. RESOLUTE BAY, CANADA
74.7°N, 94.9°W APRIL 1953

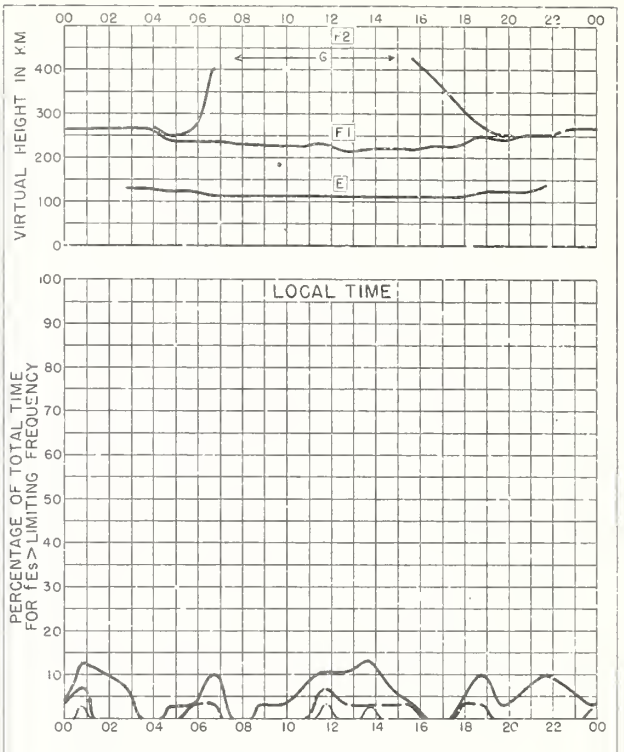


Fig. 54. RESOLUTE BAY, CANADA APRIL 1953

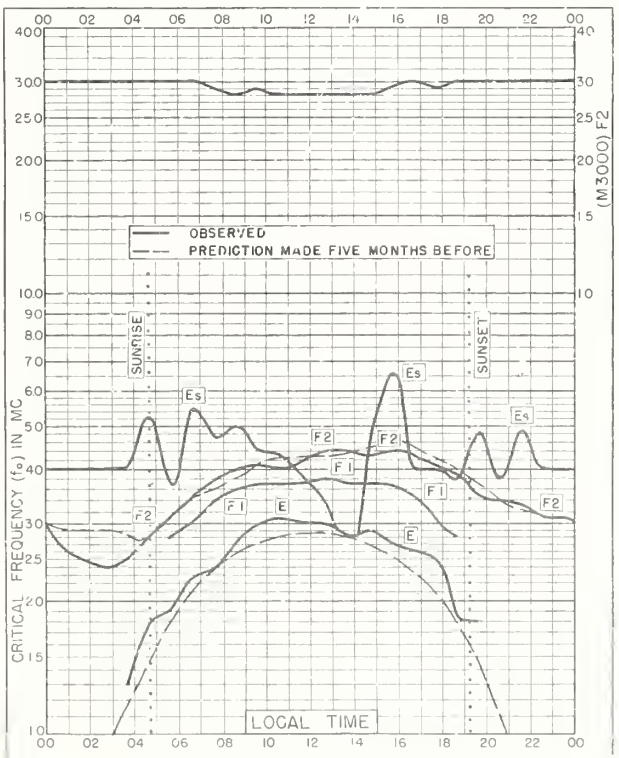


Fig. 55. BAKER LAKE, CANADA
64.3°N, 96.0°W APRIL 1953

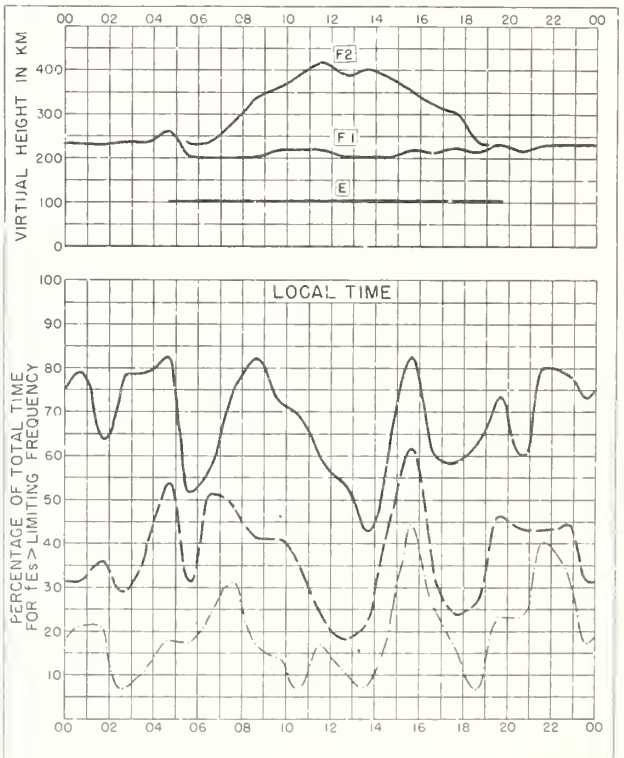


Fig. 56. BAKER LAKE, CANADA APRIL 1953

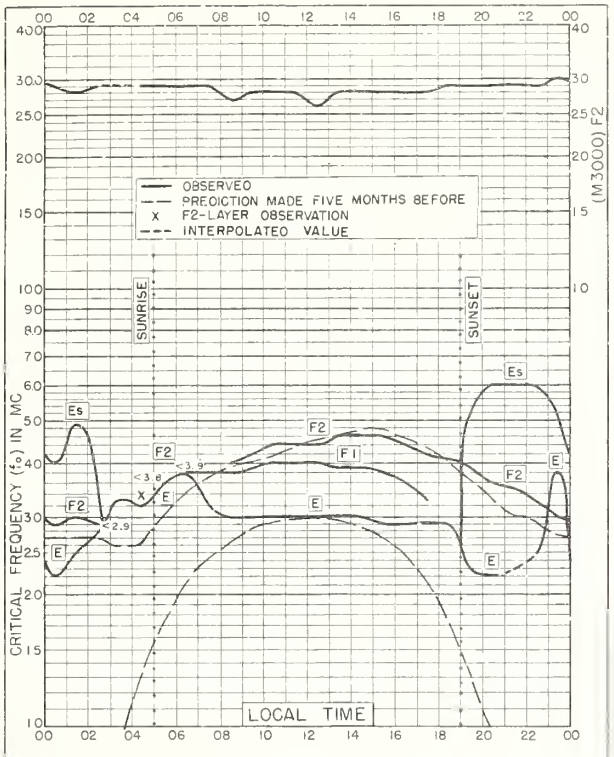


Fig. 57. FORT CHIMO, CANADA
58.1°N, 68.3°W APRIL 1953

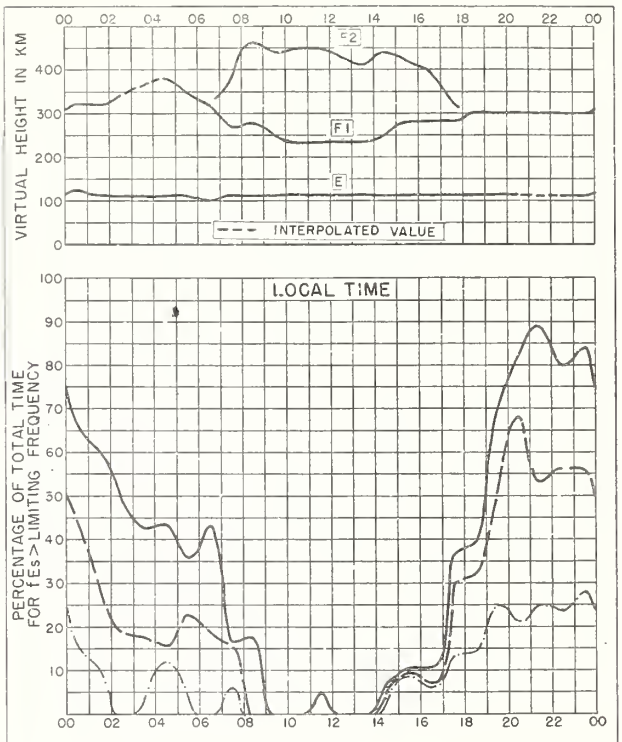


Fig. 58. FORT CHIMO, CANADA APRIL 1953

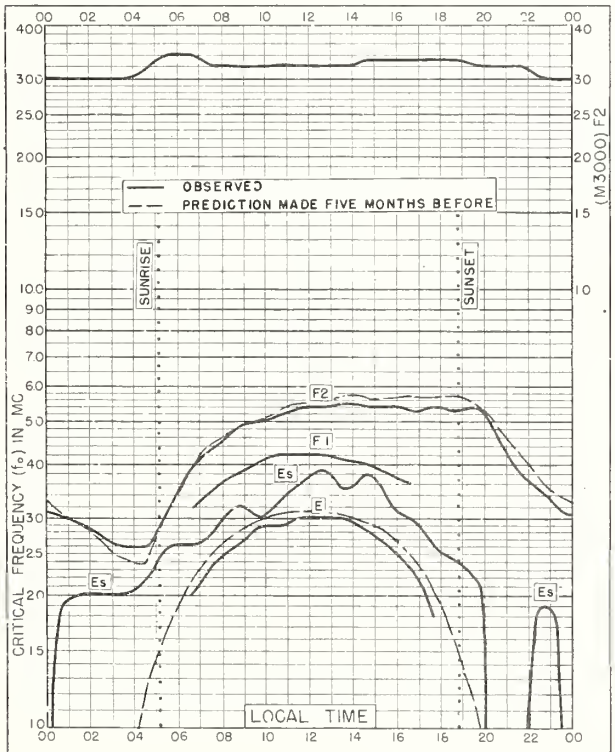


Fig. 59. LINDAU/ HARZ, GERMANY
51.6°N, 10.1°E APRIL 1953

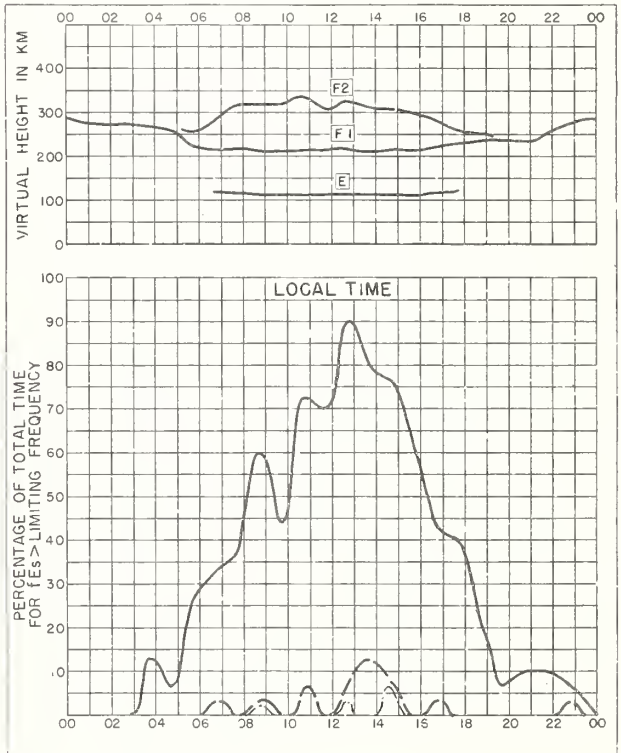


Fig. 60. LINDAU/ HARZ, GERMANY APRIL 1953

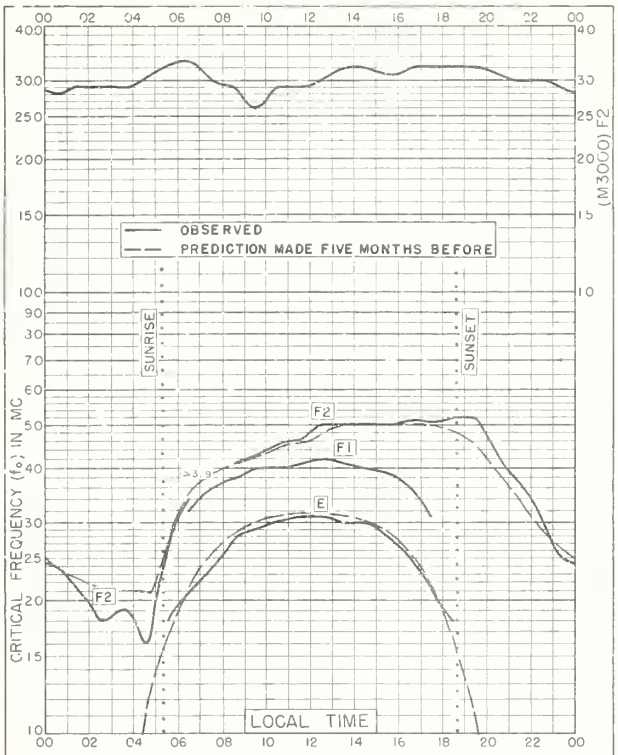


Fig. 61. ST. JOHN'S, NEWFOUNDLAND
47.6°N, 52.7°W APRIL 1953

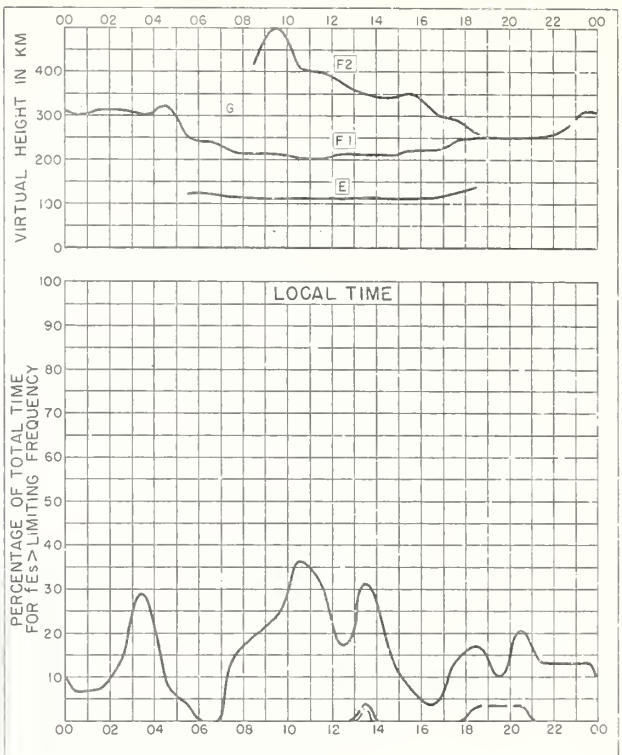


Fig. 62. ST. JOHN'S, NEWFOUNDLAND APRIL 1953

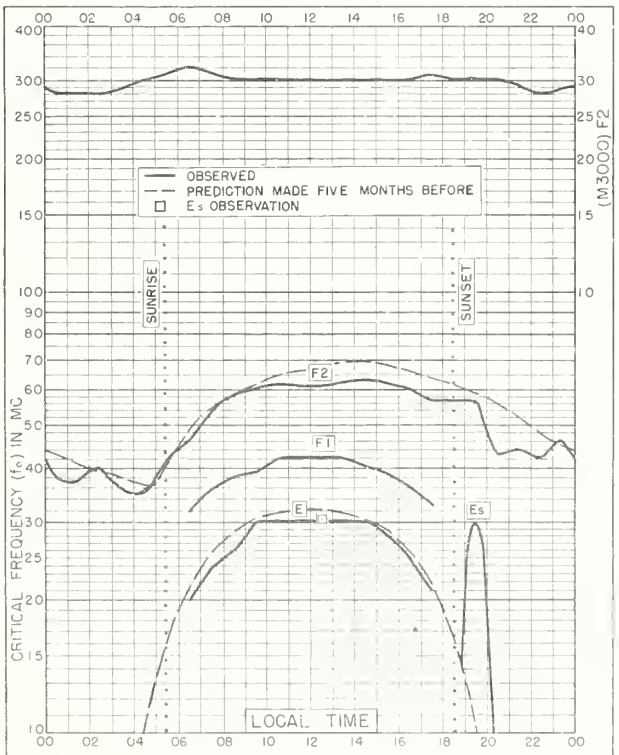


Fig. 63. WAKKANAI, JAPAN
45.4° N, 141.7° E APRIL 1953

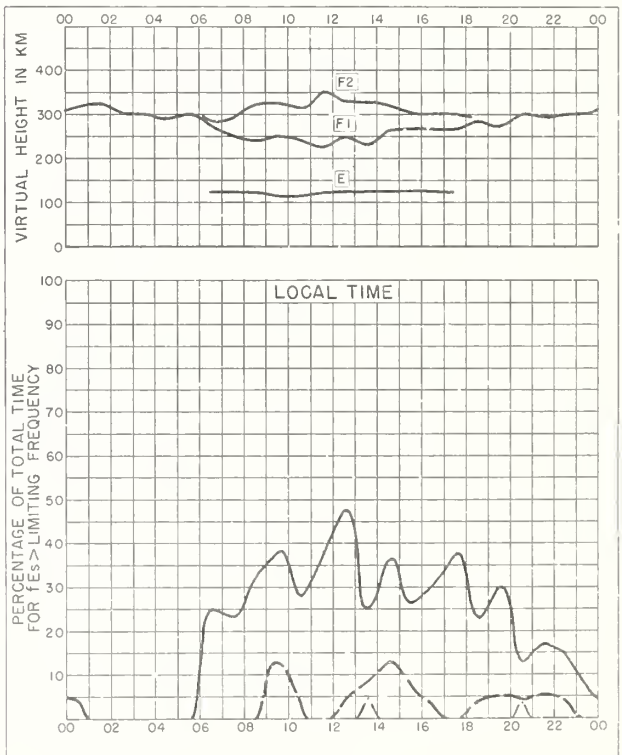


Fig. 64. WAKKANAI, JAPAN APRIL 1953

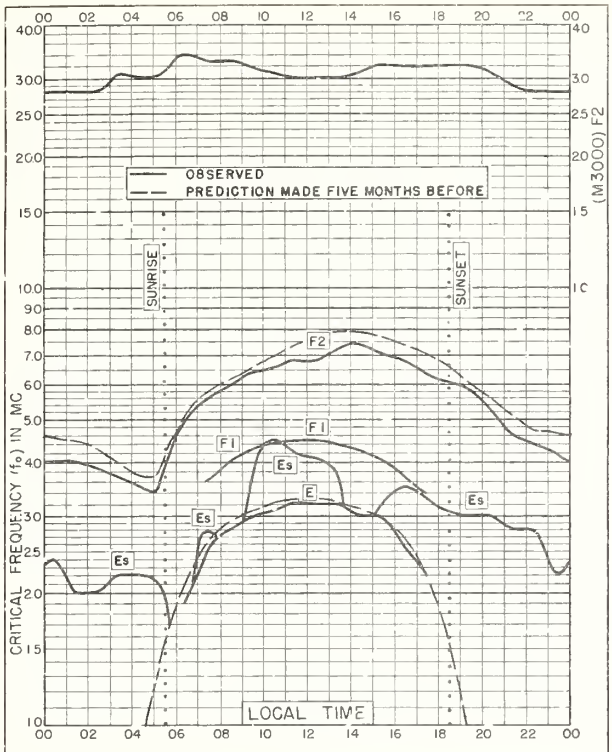


Fig. 65. AKITA, JAPAN
39.7° N, 140.1° E
APRIL 1953

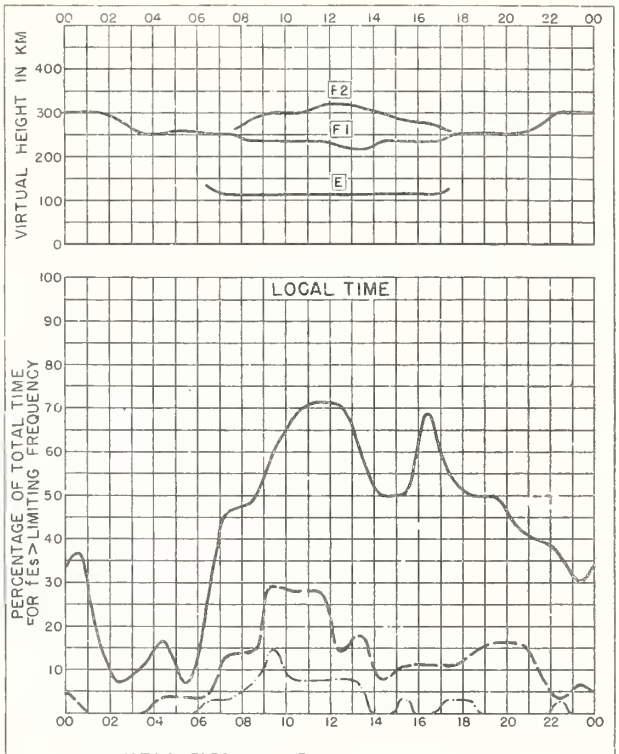


Fig. 66. AKITA, JAPAN
APRIL 1953

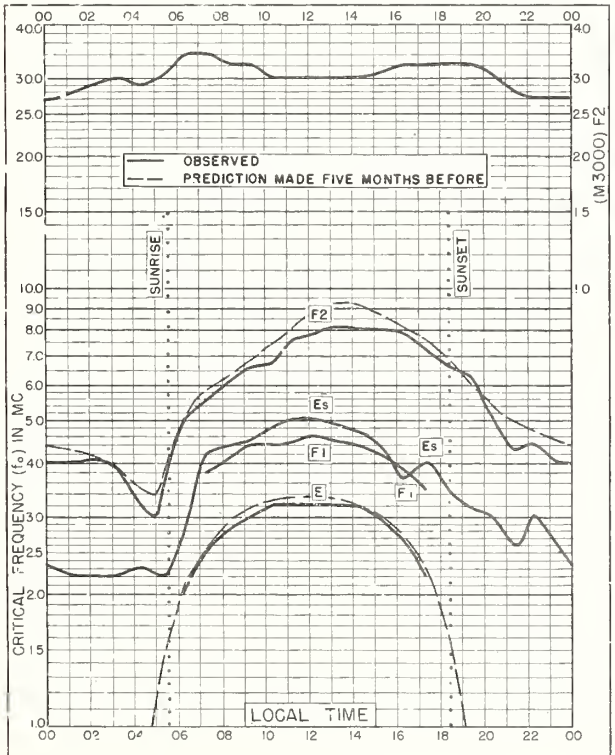


Fig. 67. TOKYO, JAPAN
35.7°N, 139.5°E
APRIL 1953

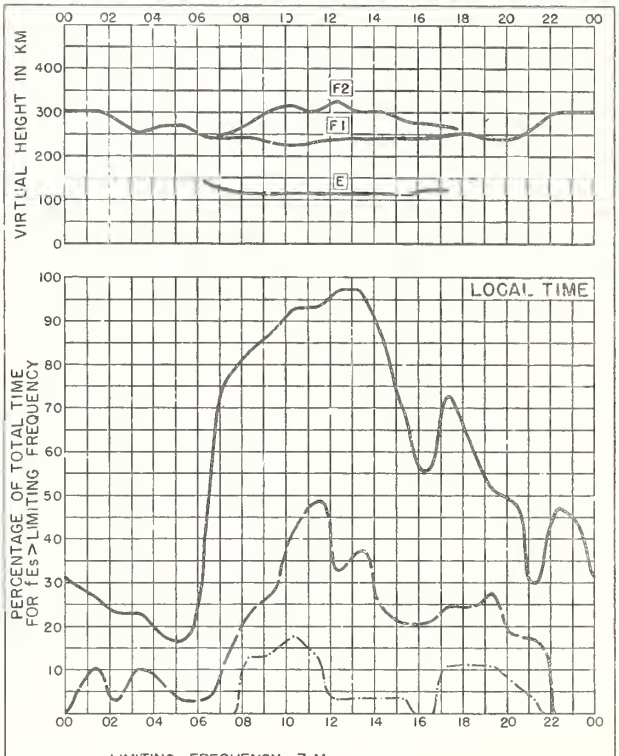


Fig. 68. TOKYO, JAPAN
APRIL 1953

N.B.S. 496

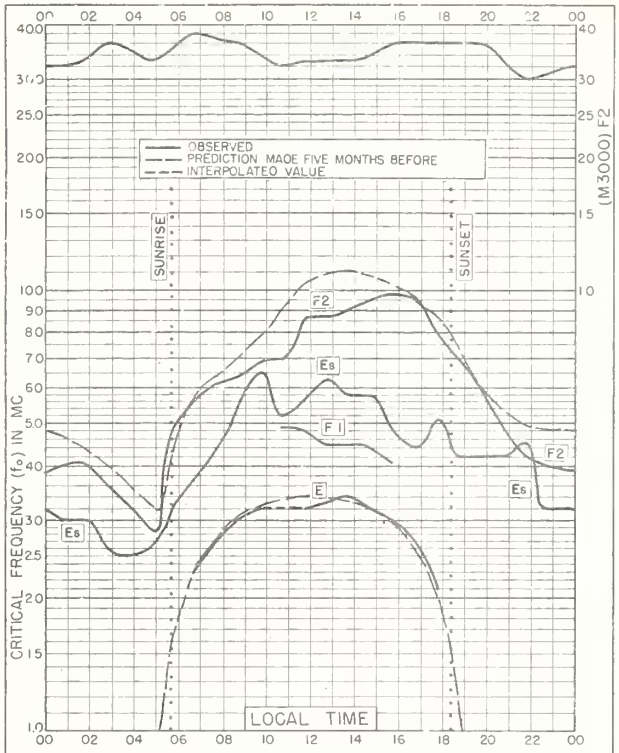


Fig. 69. YAMAGAWA, JAPAN
31.2° N, 130.6° E APRIL 1953

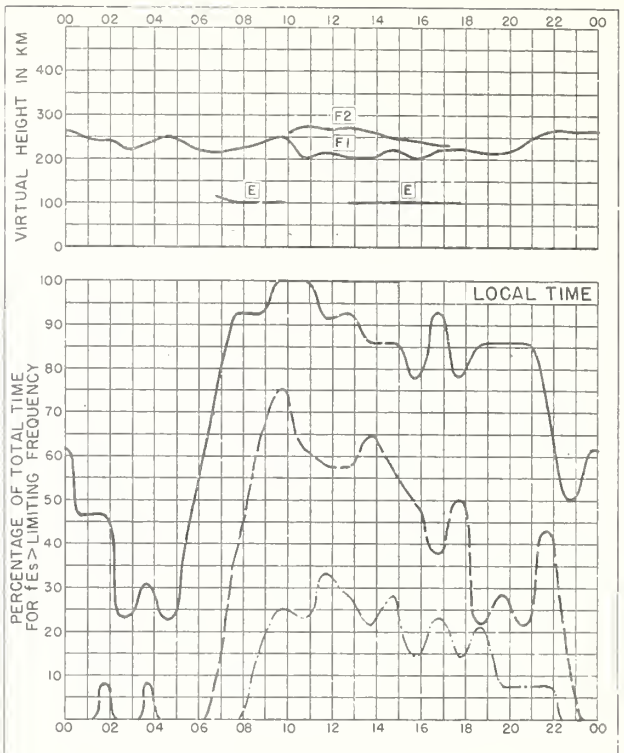


Fig. 70. YAMAGAWA, JAPAN APRIL 1953

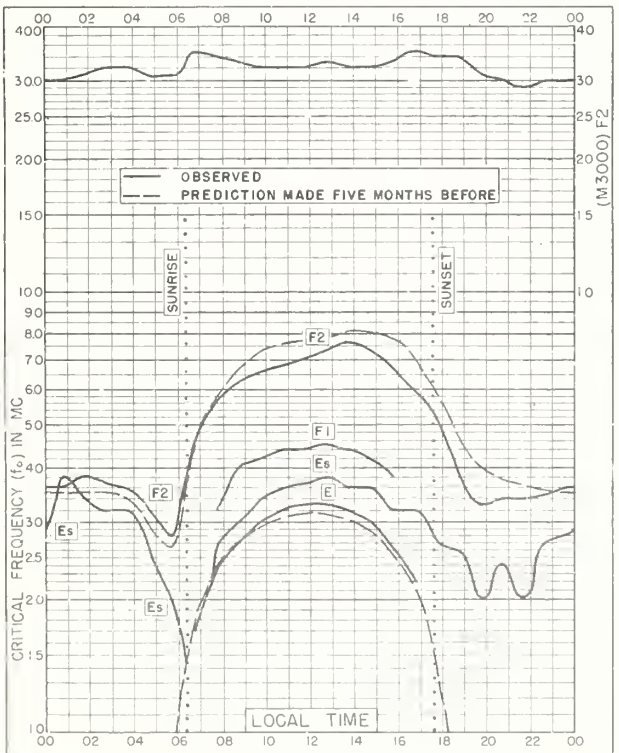


Fig. 71. WATHEROO, W. AUSTRALIA
30.3° S, 115.9° E APRIL 1953

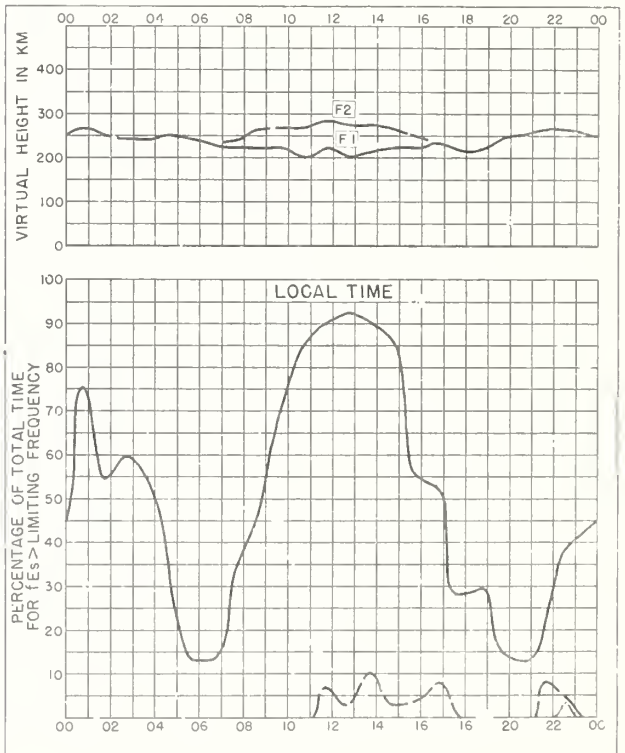


Fig. 72. WATHEROO, W. AUSTRALIA APRIL 1953

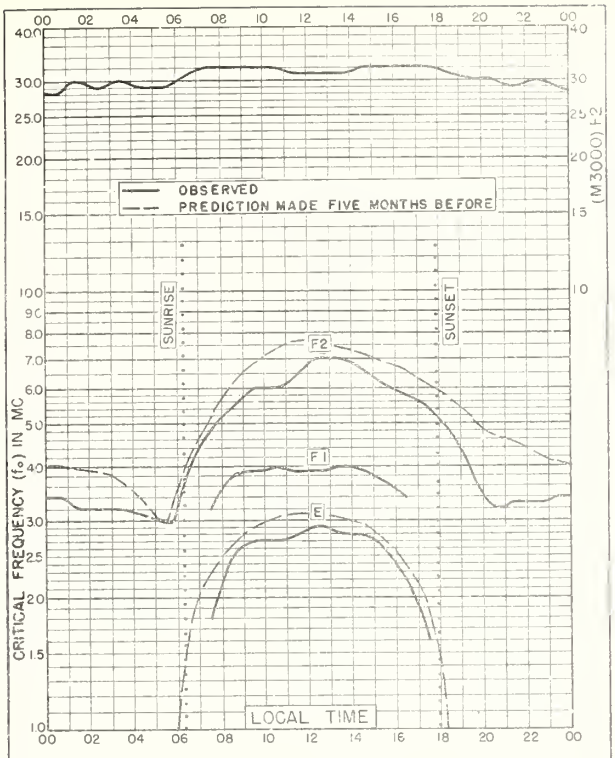


Fig. 73. WAKKANAI, JAPAN
45.4°N, 141.7°E MARCH 1953

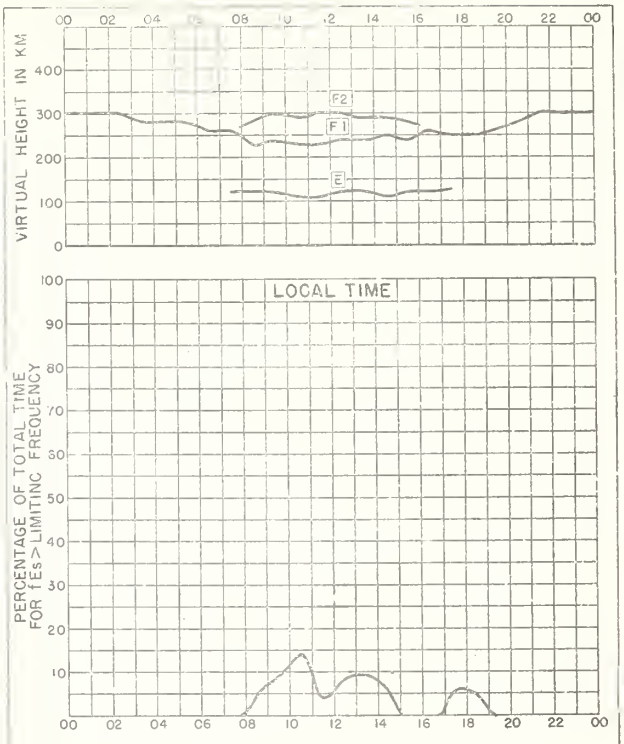


Fig. 74. WAKKANAI, JAPAN MARCH 1953

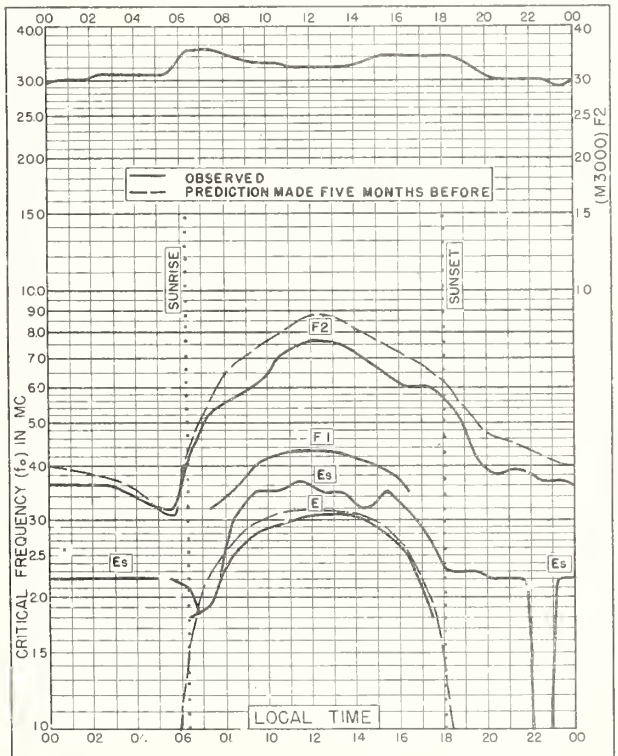


Fig. 75. AKITA, JAPAN
39.7° N. 140.1°E MARCH 1953

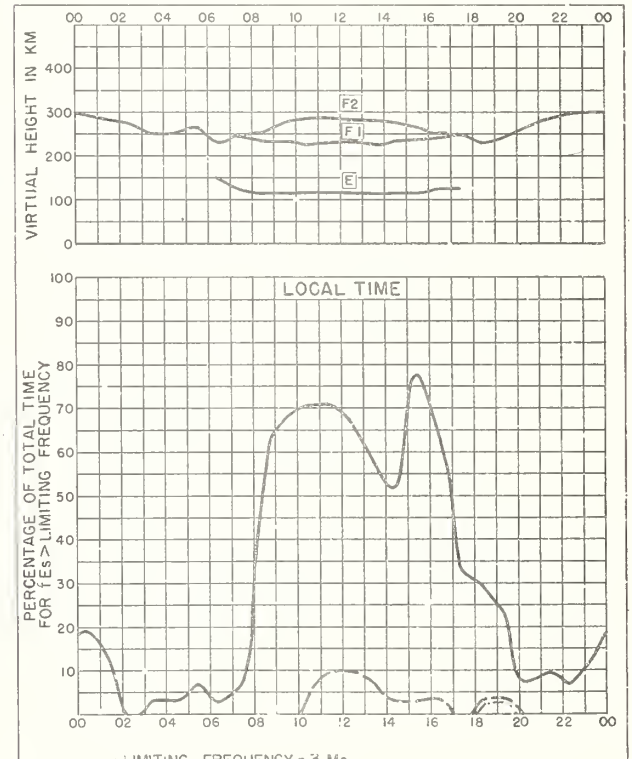
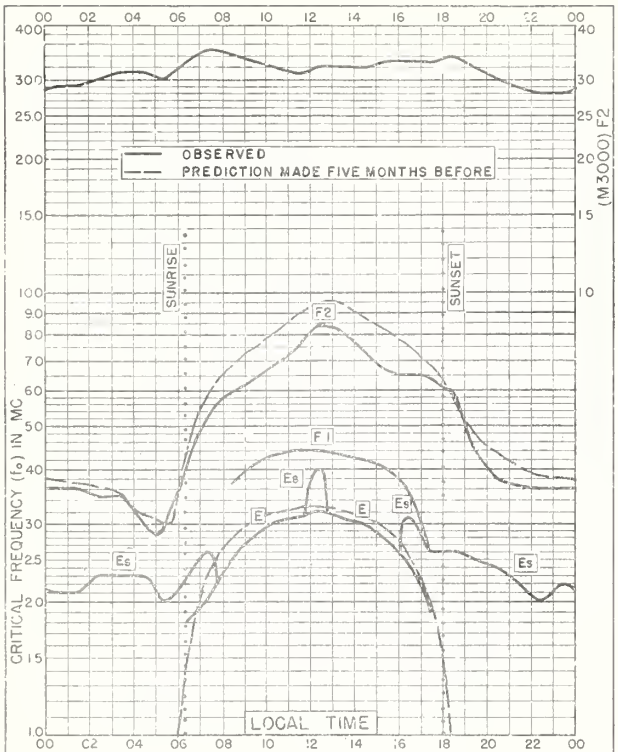


Fig. 76. AKITA, JAPAN MARCH 1953



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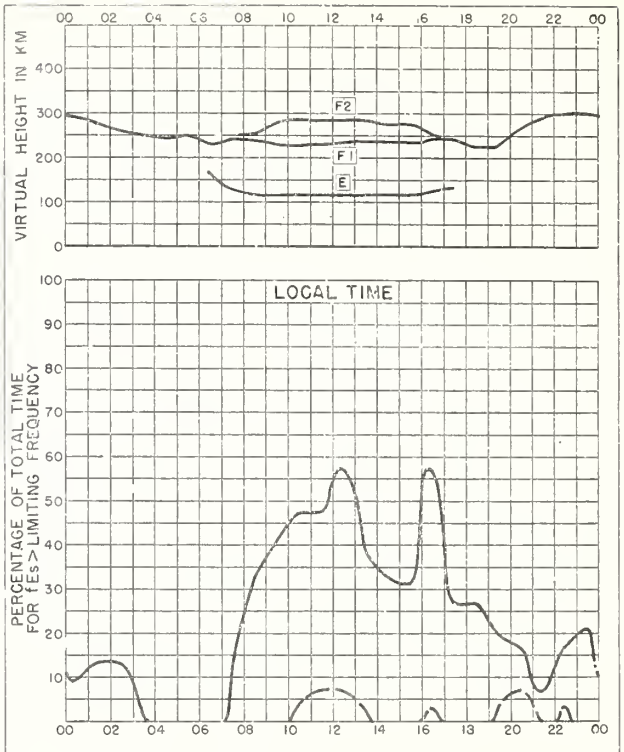
35.7° N, 139.5° E MARCH 1953



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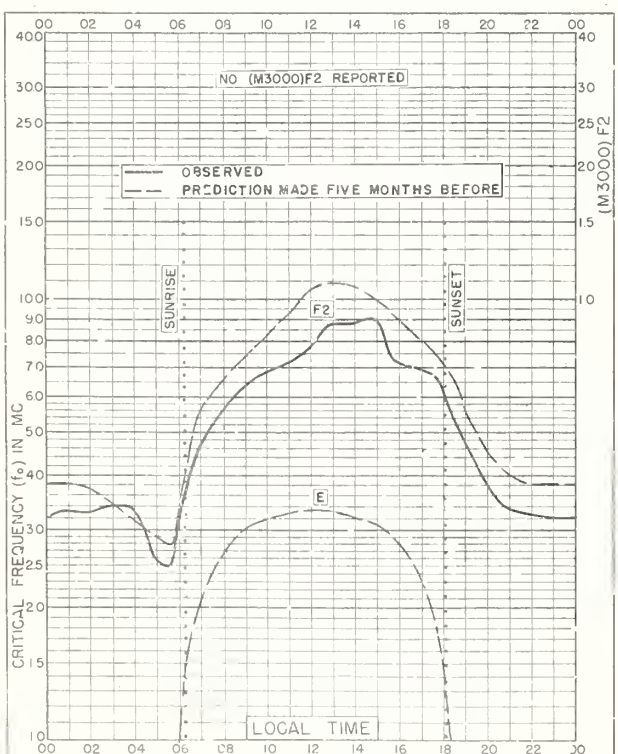

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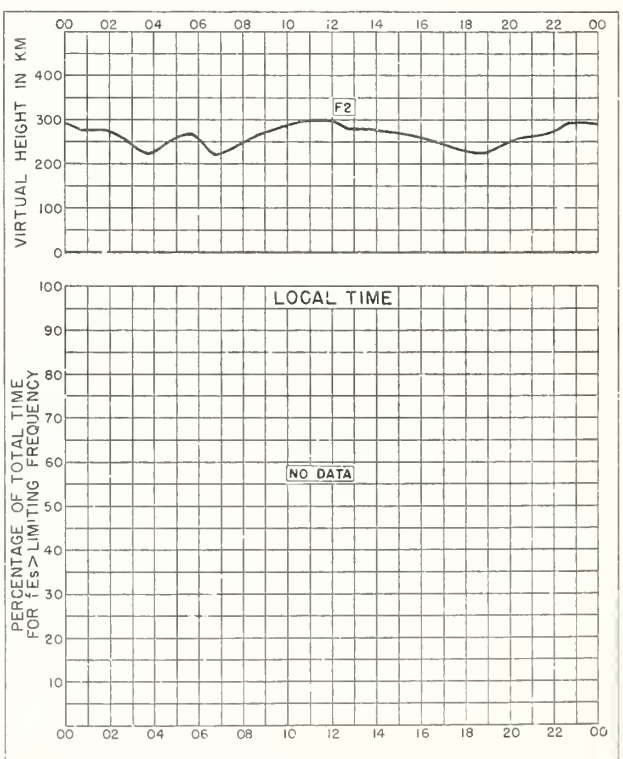

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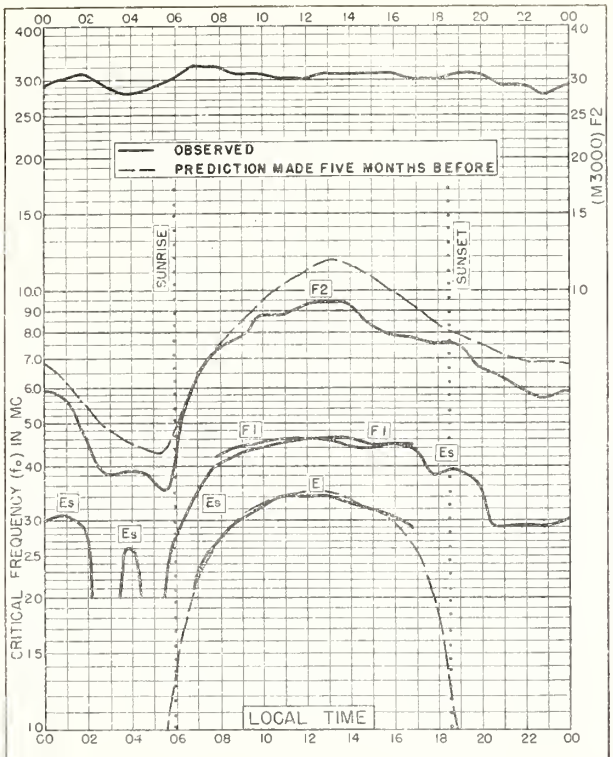

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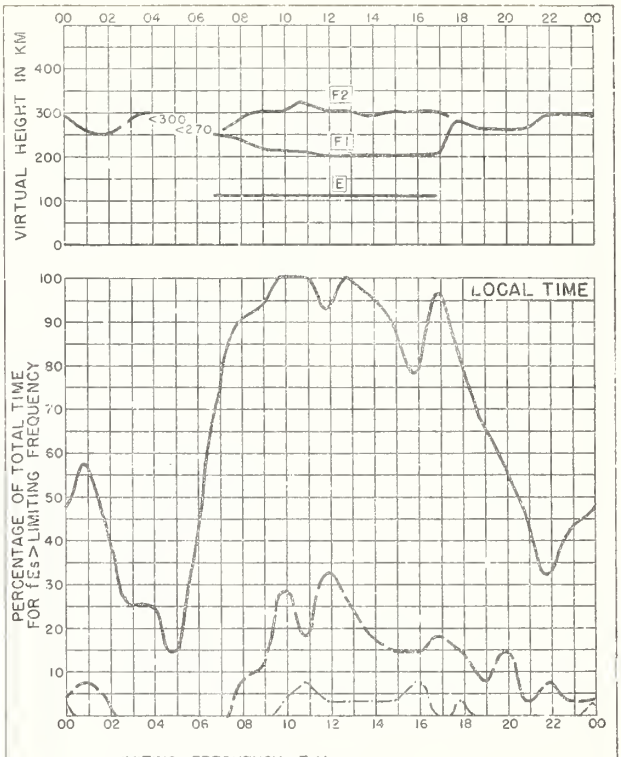

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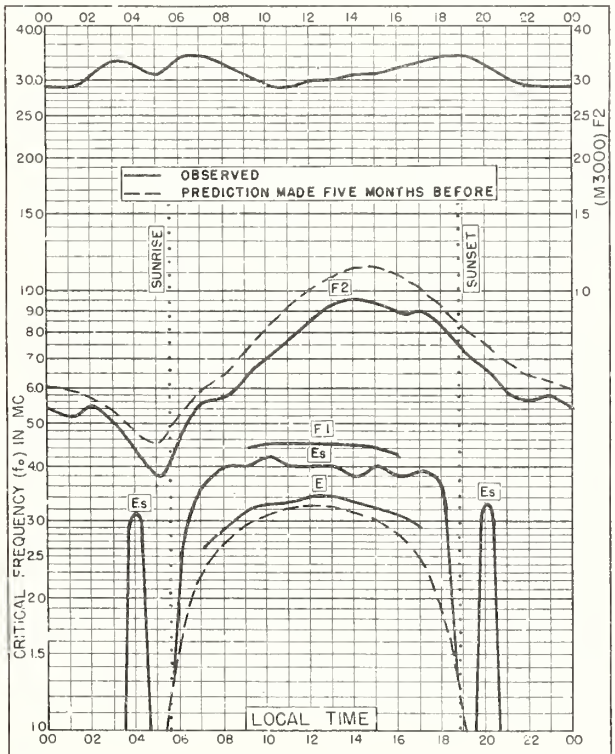

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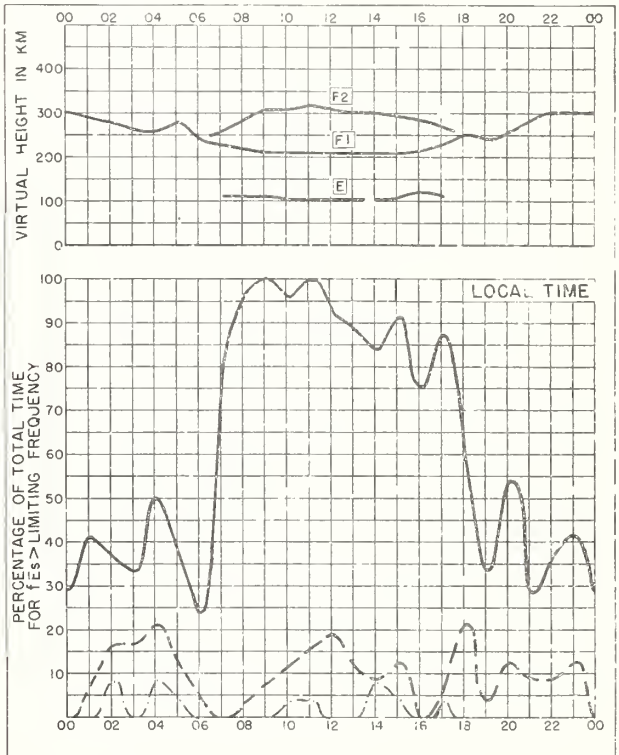

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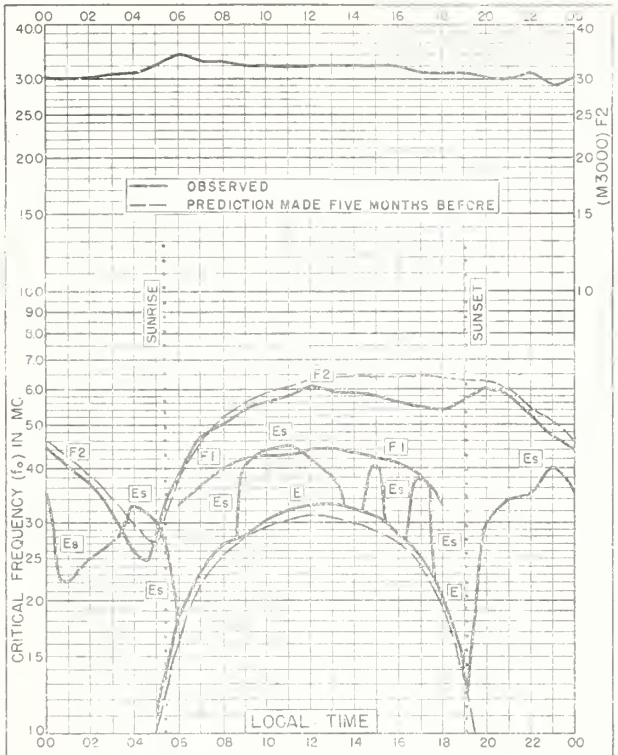

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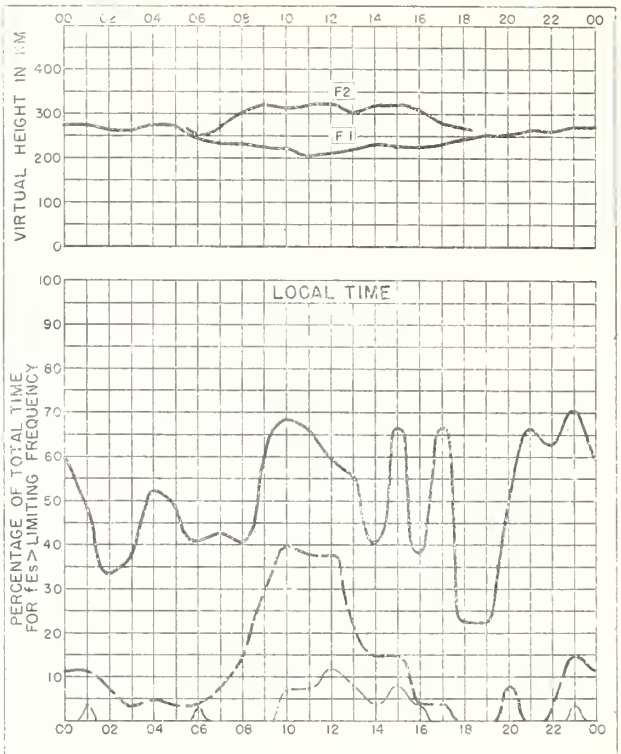

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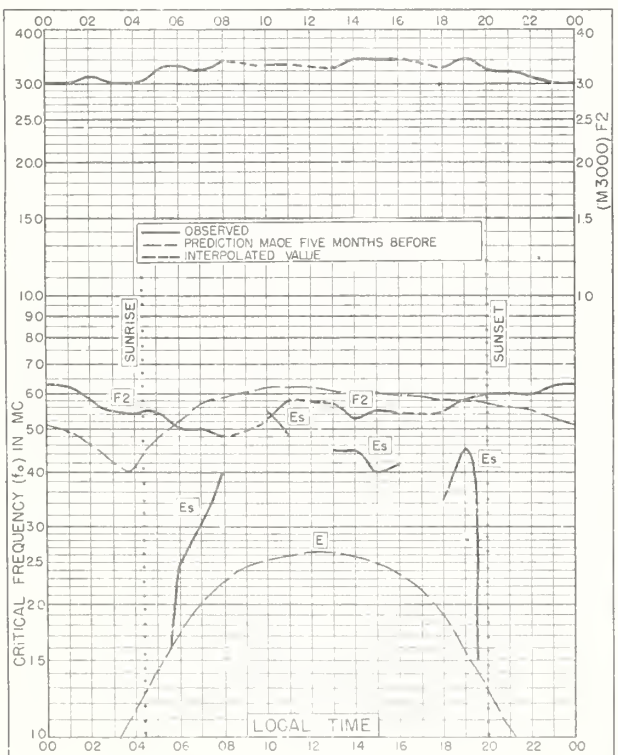

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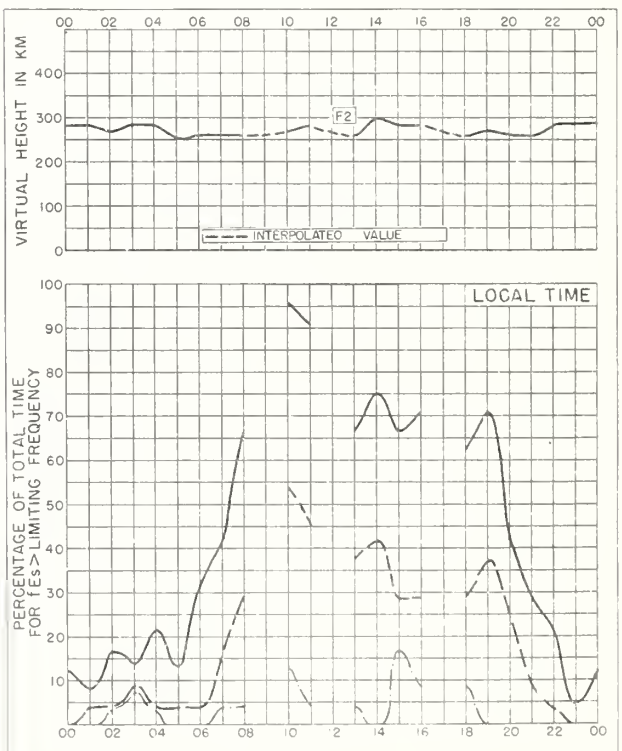

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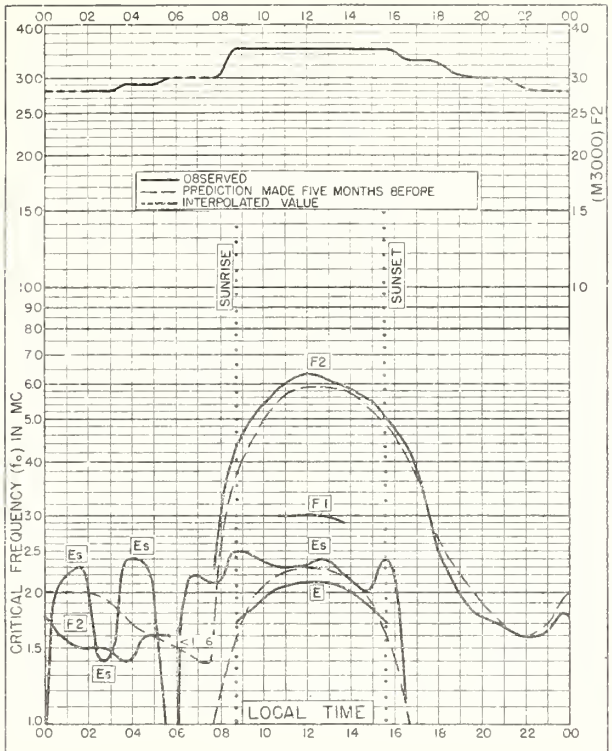

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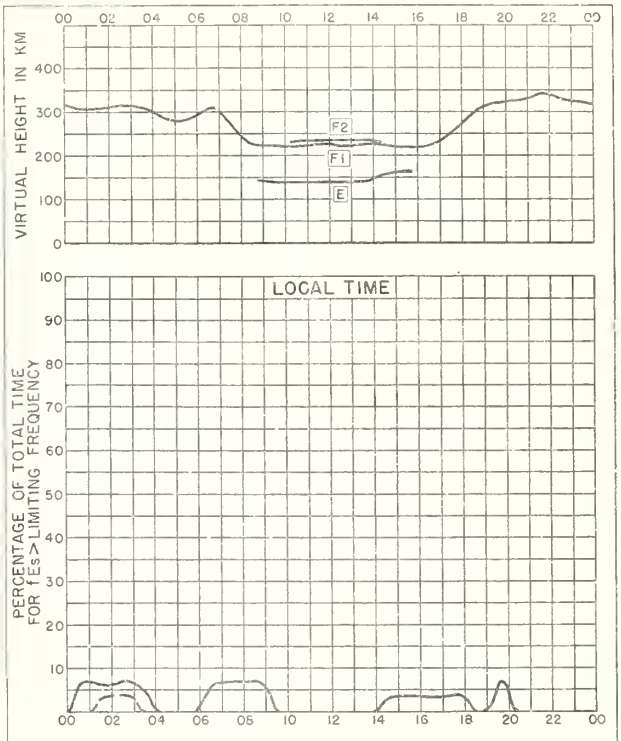

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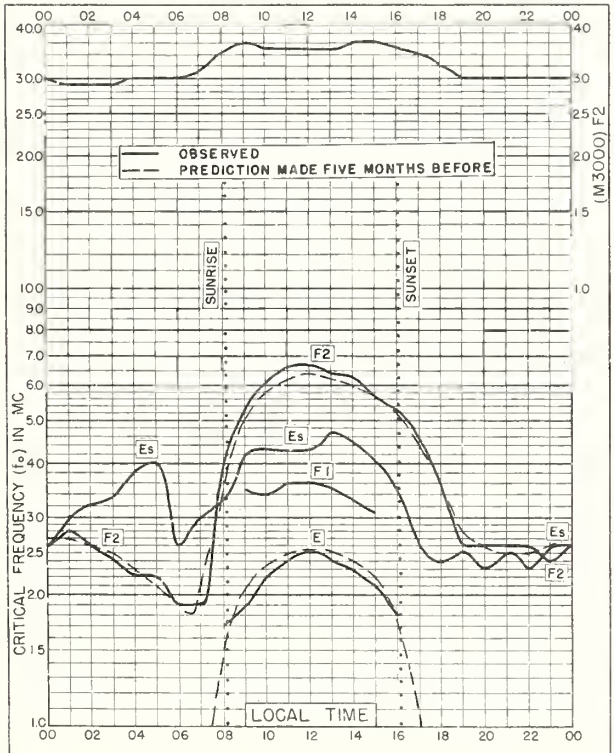

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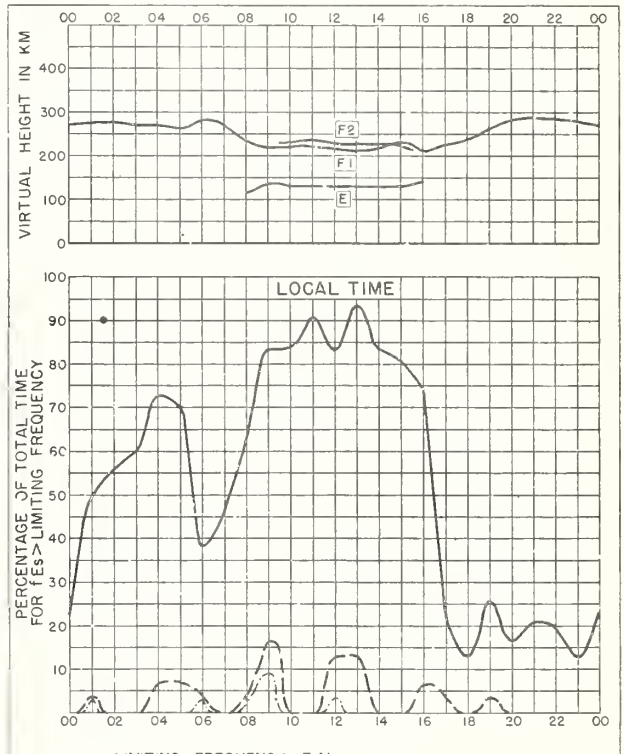

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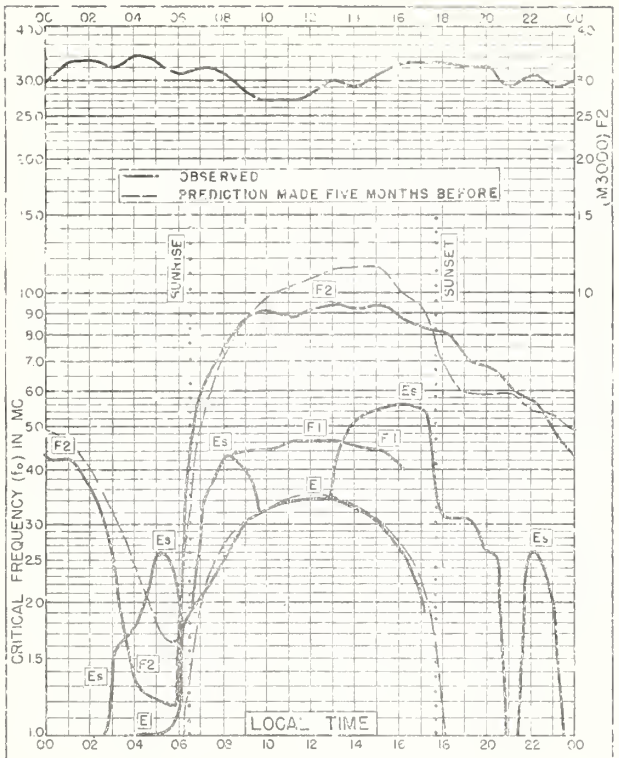

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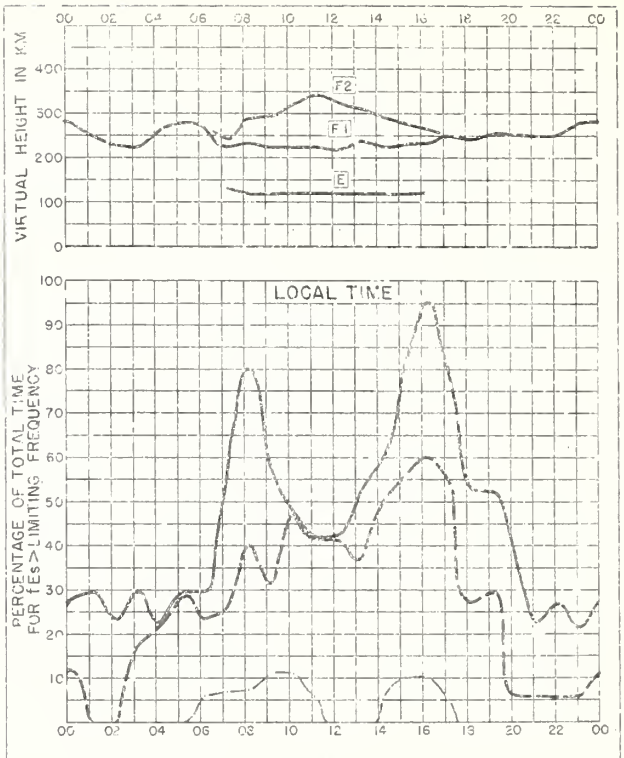

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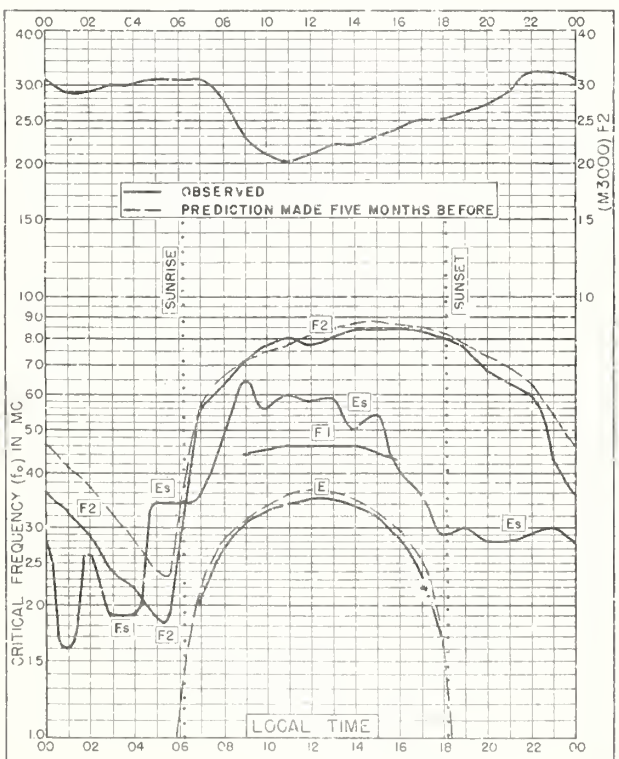

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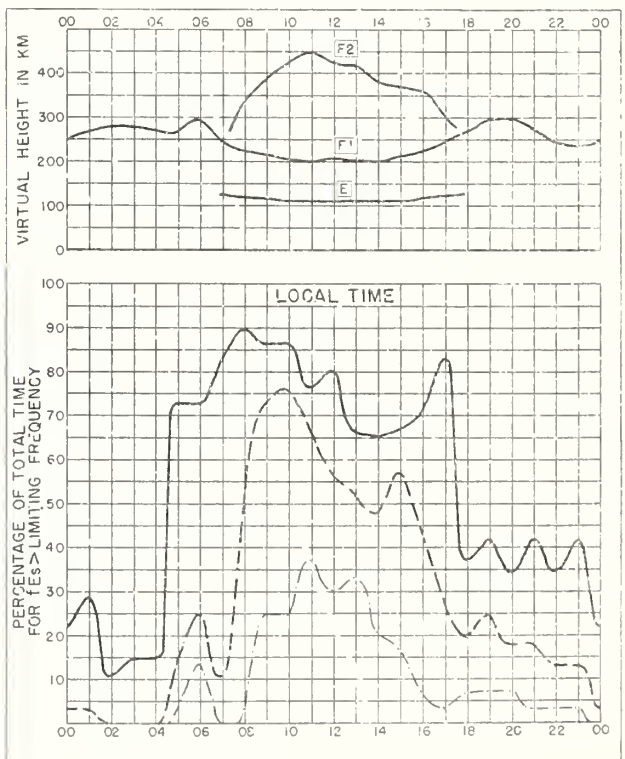

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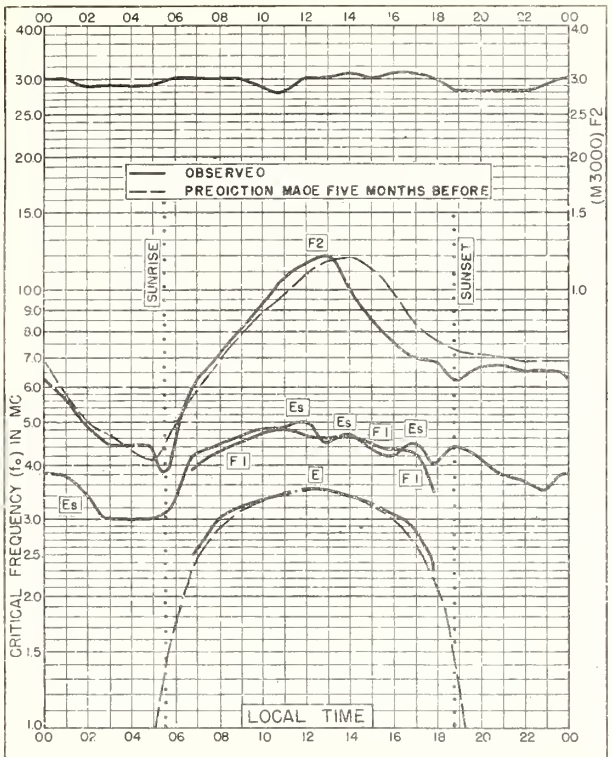

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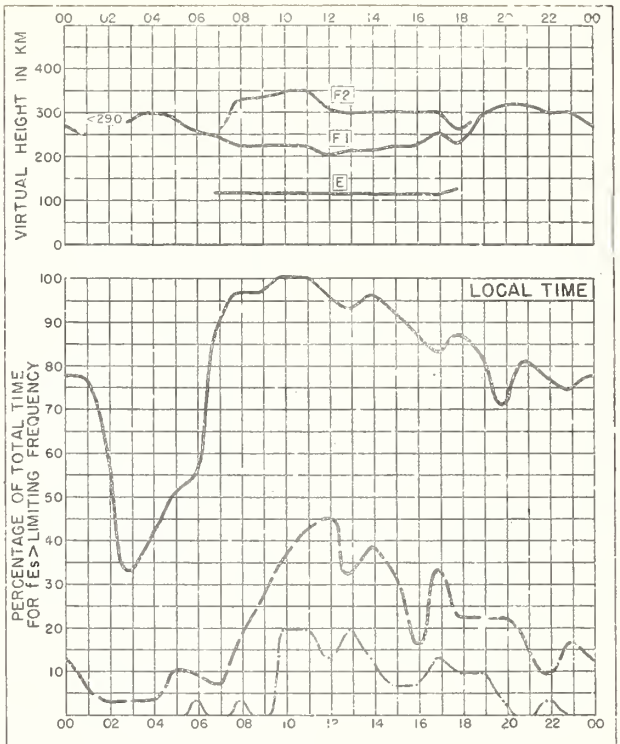
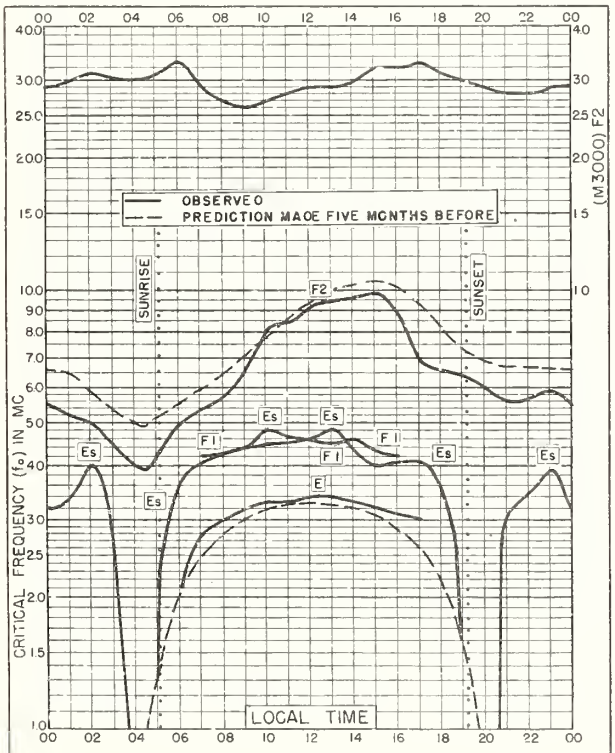


Fig. 98. RAROTONGA I. JANUARY 1953



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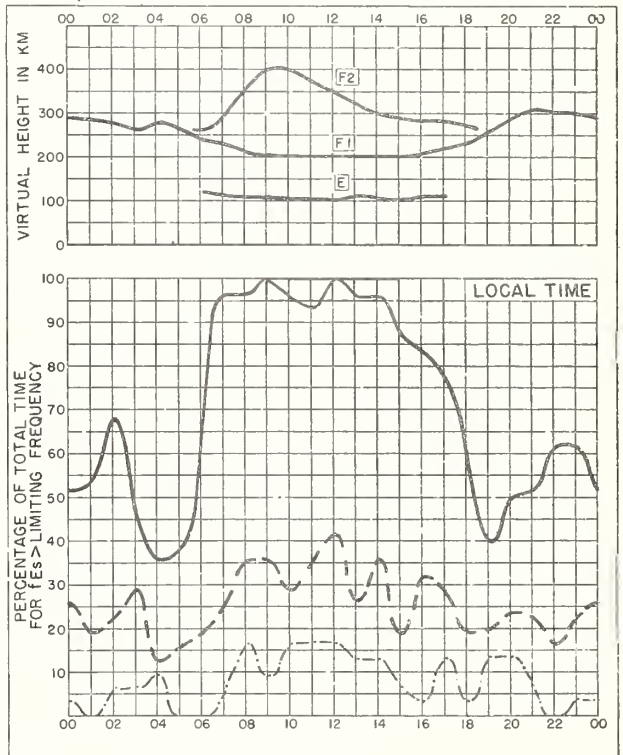

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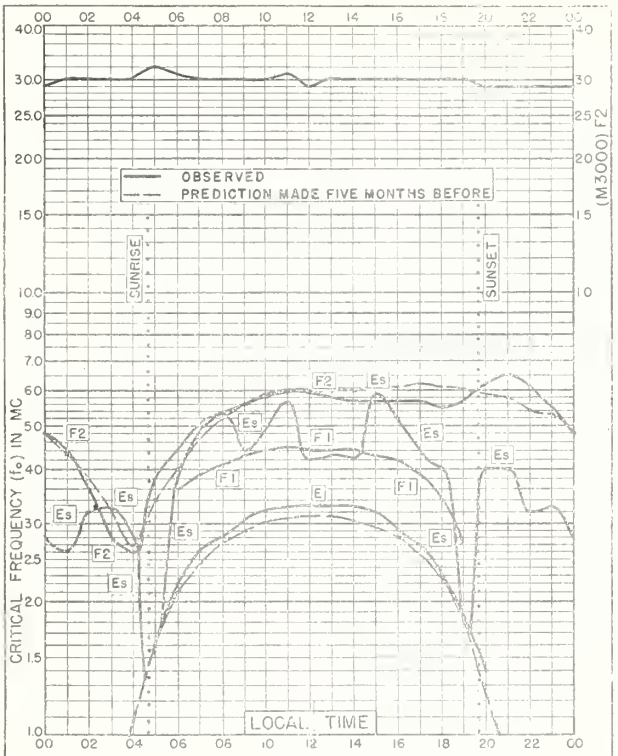

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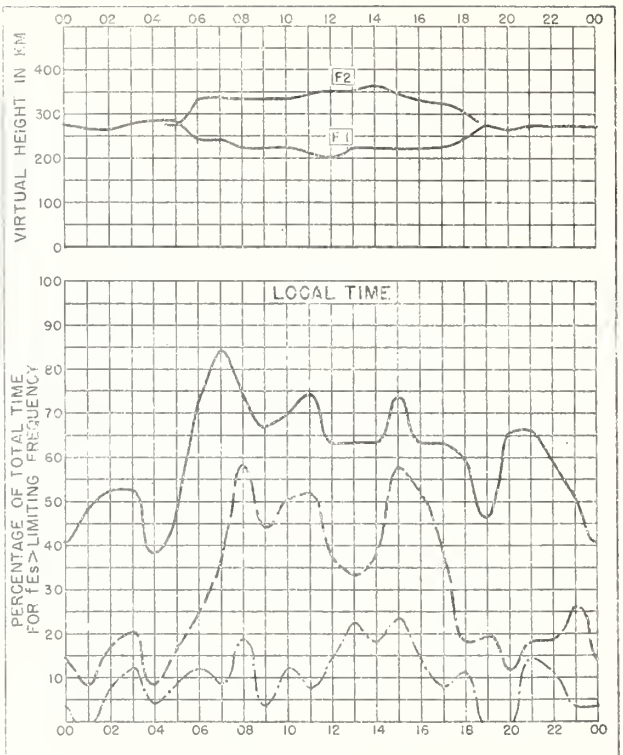

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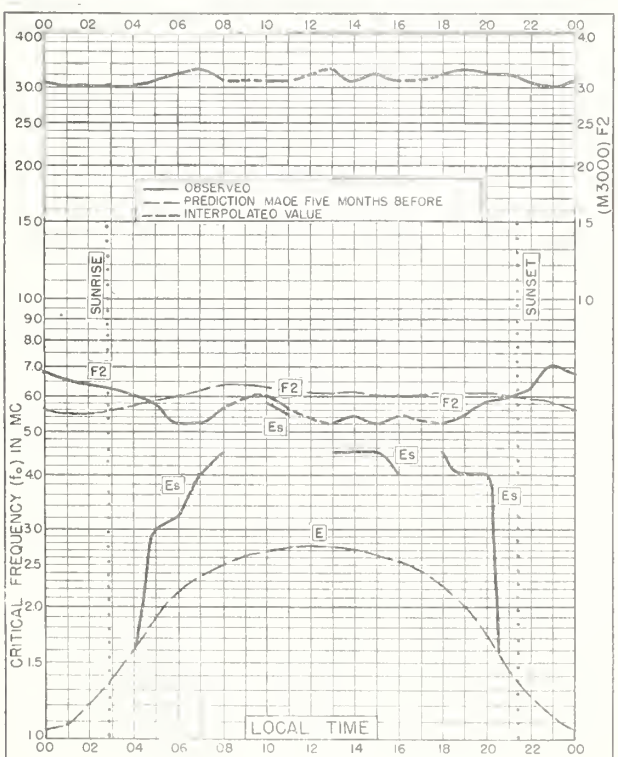

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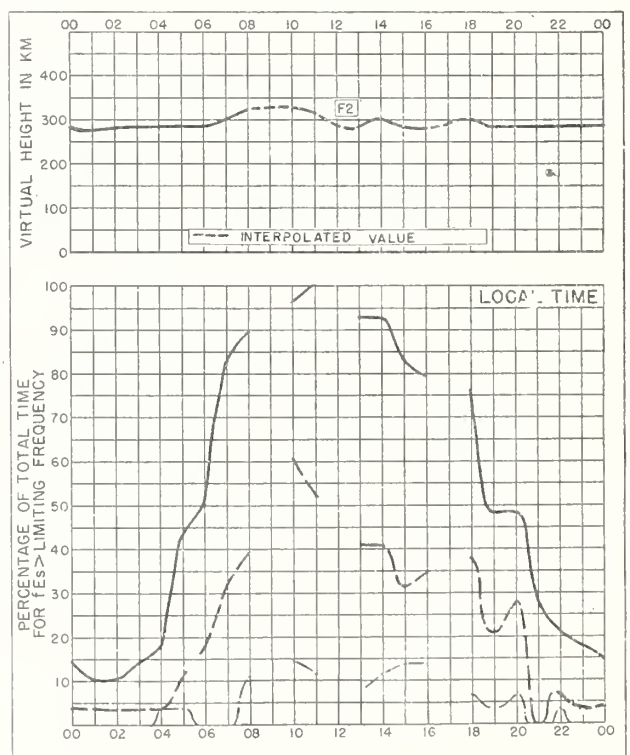

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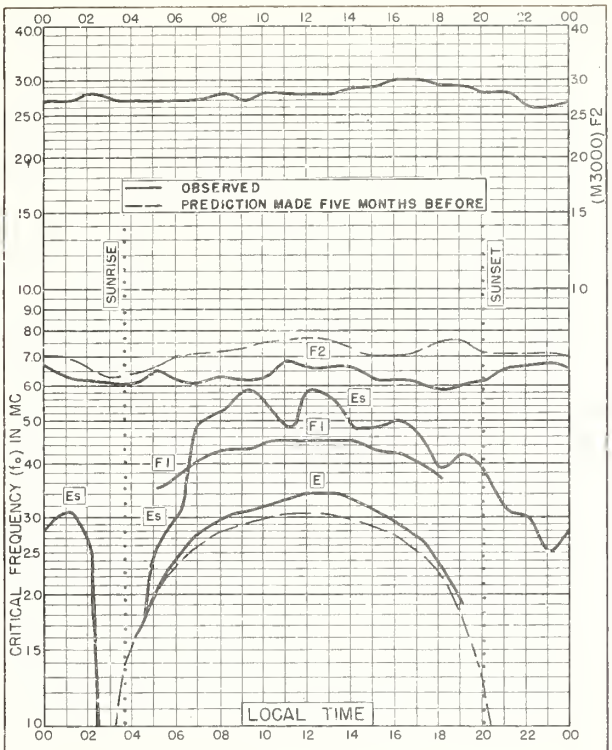

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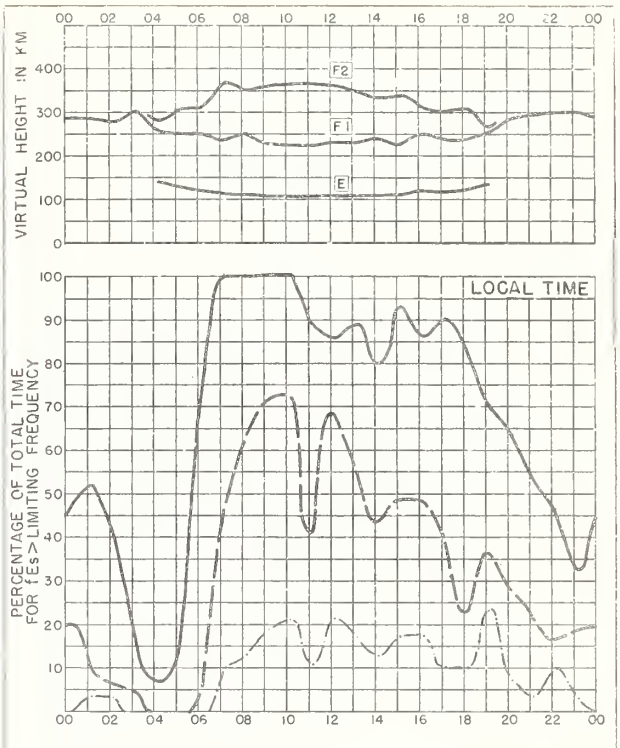

Fig. 106. FALKLAND IS. DECEMBER 1952

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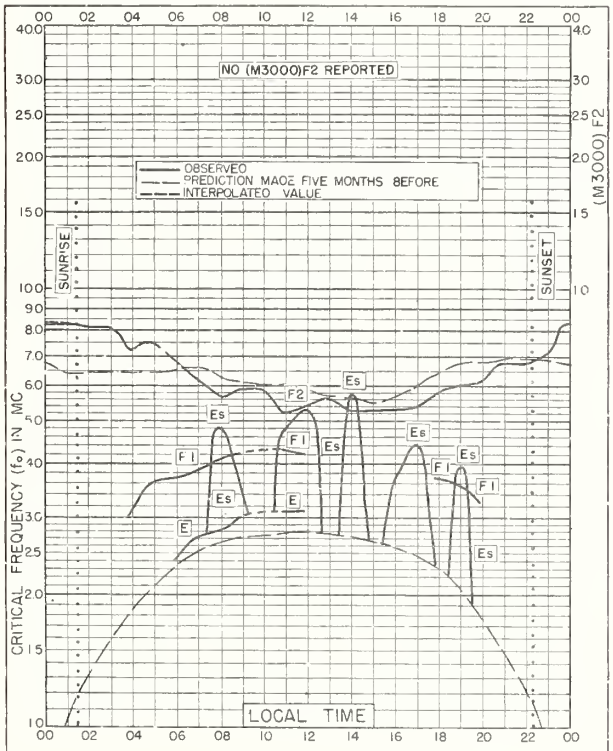

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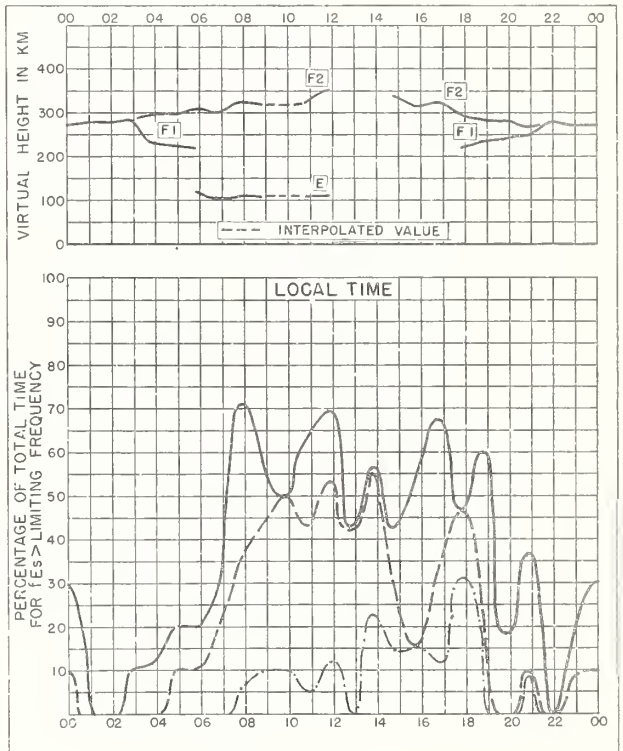

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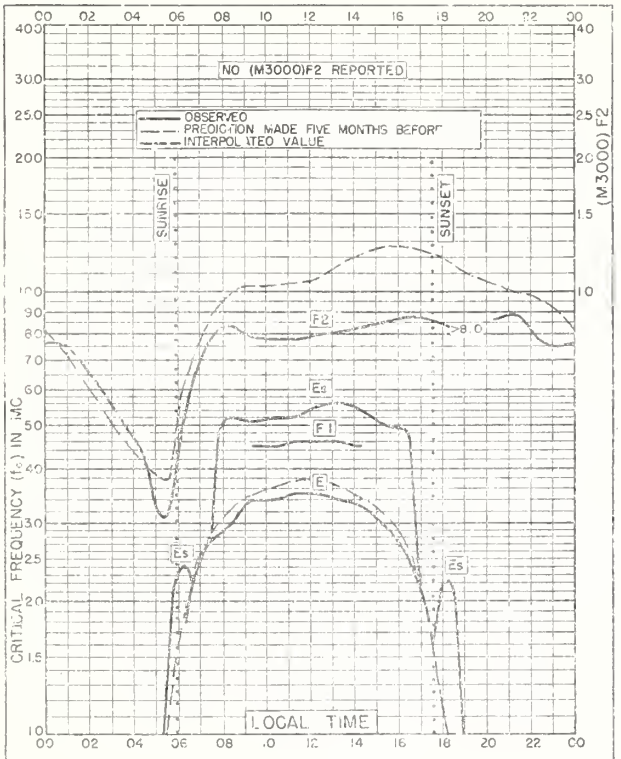

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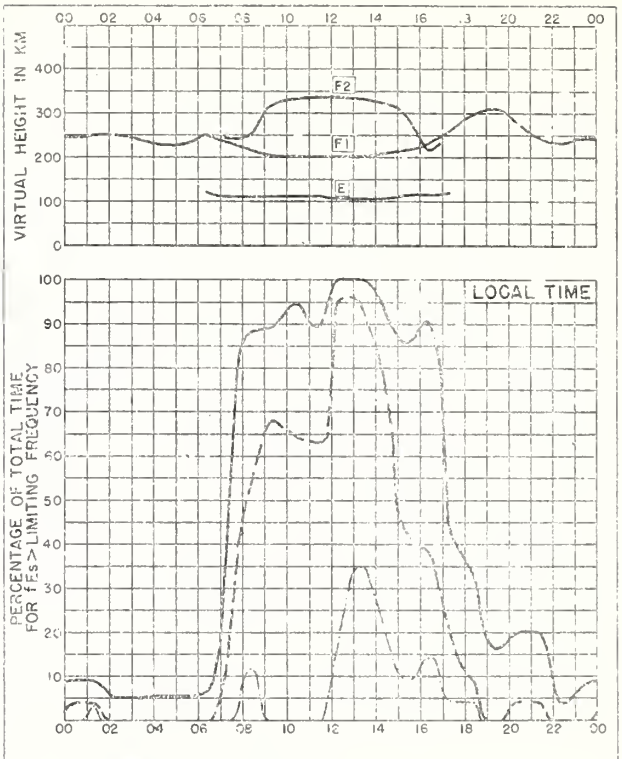

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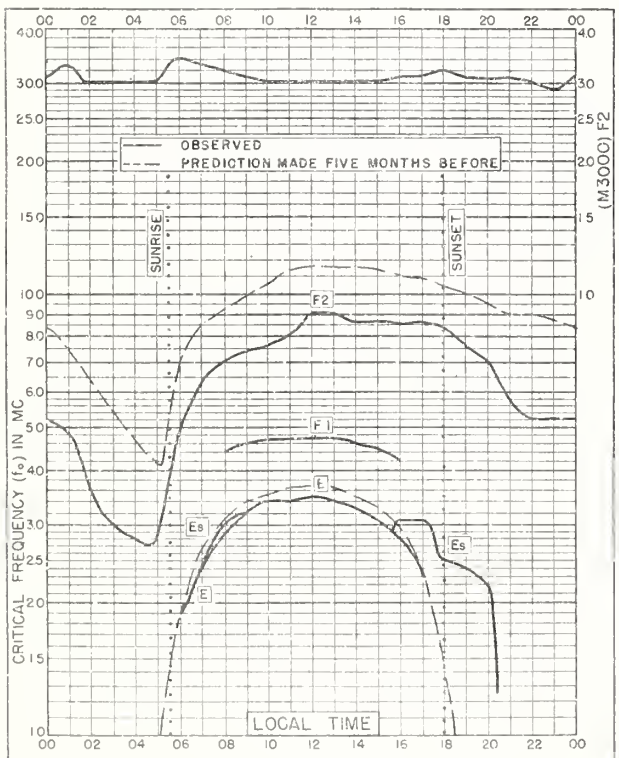

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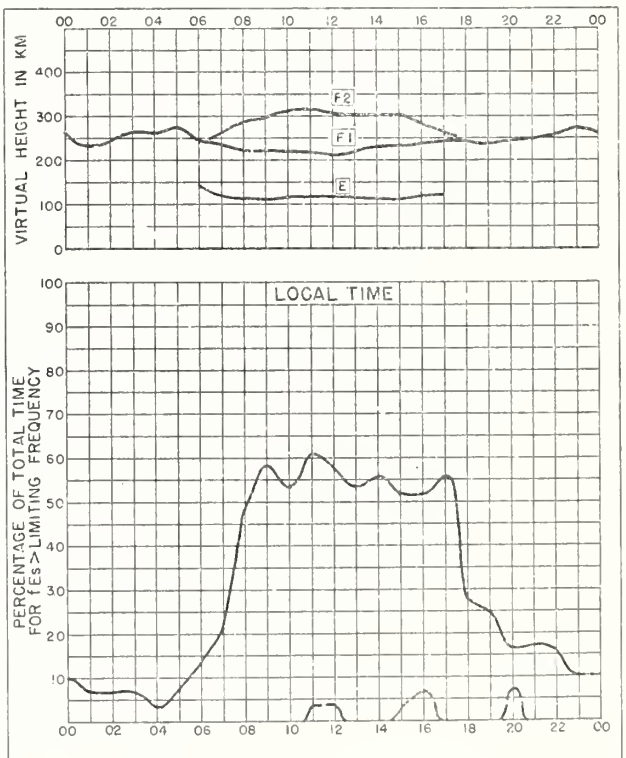

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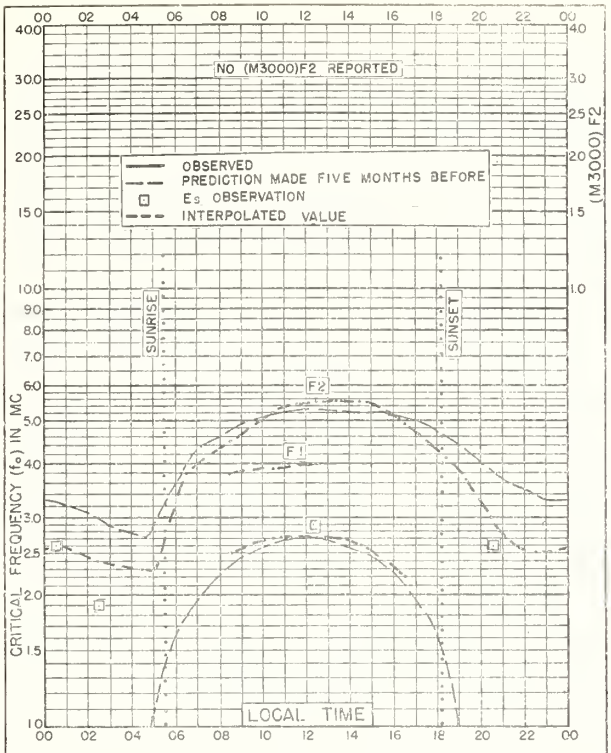

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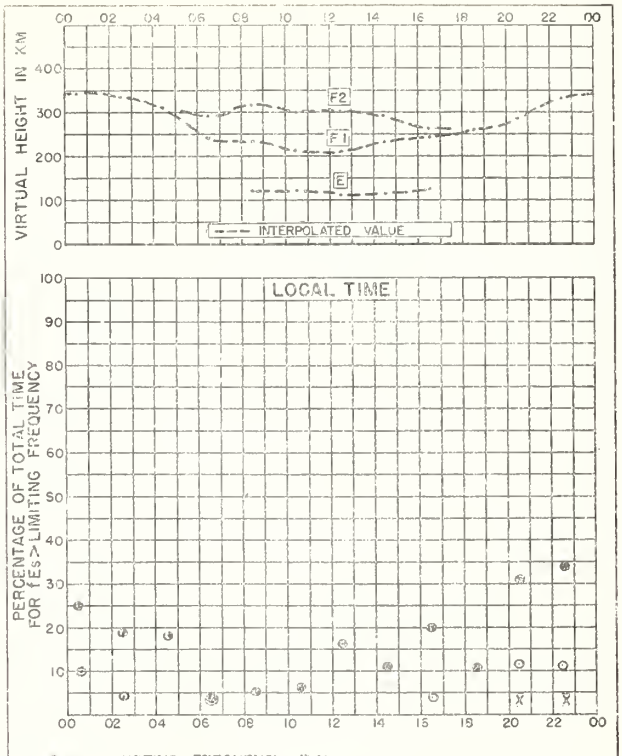

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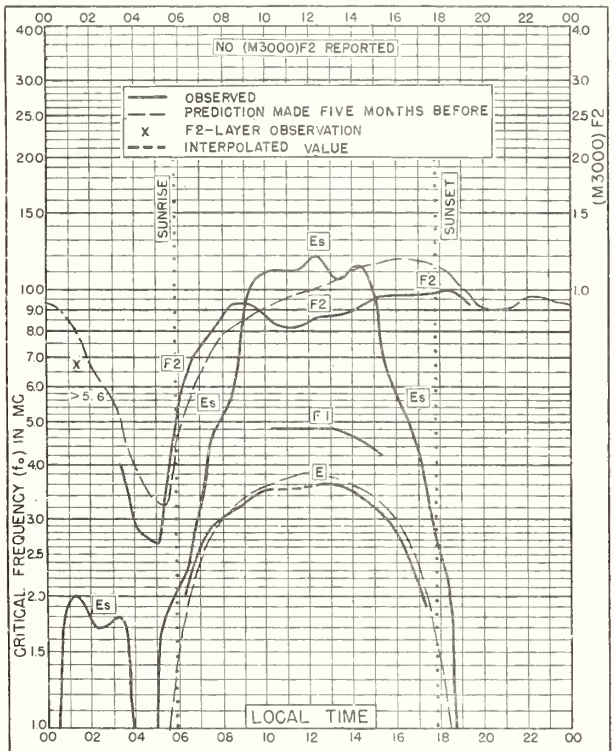

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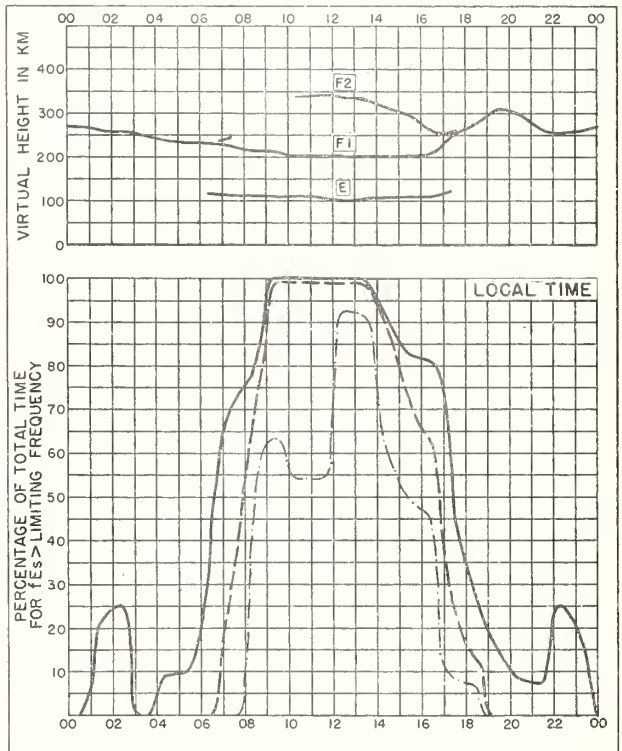

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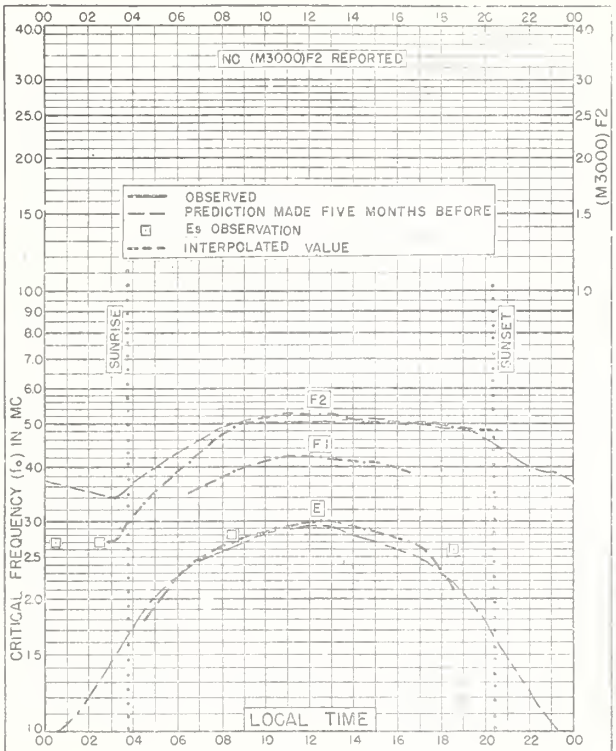

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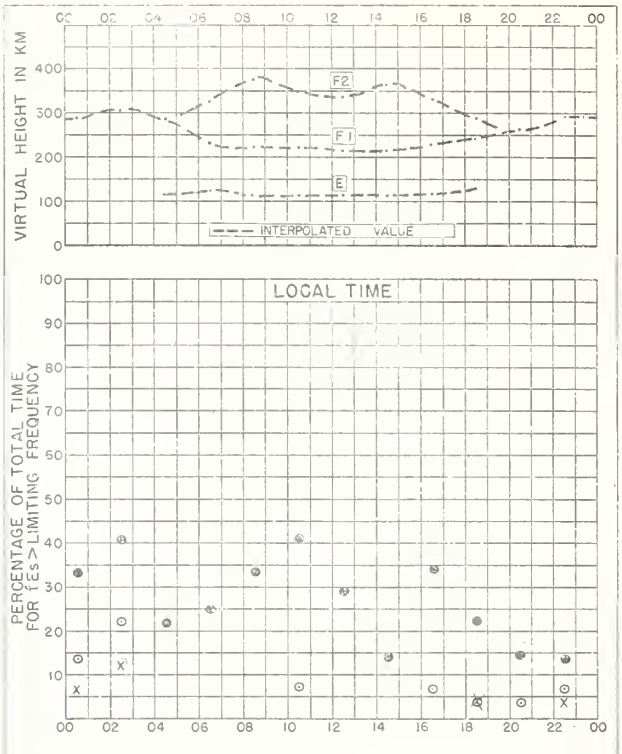

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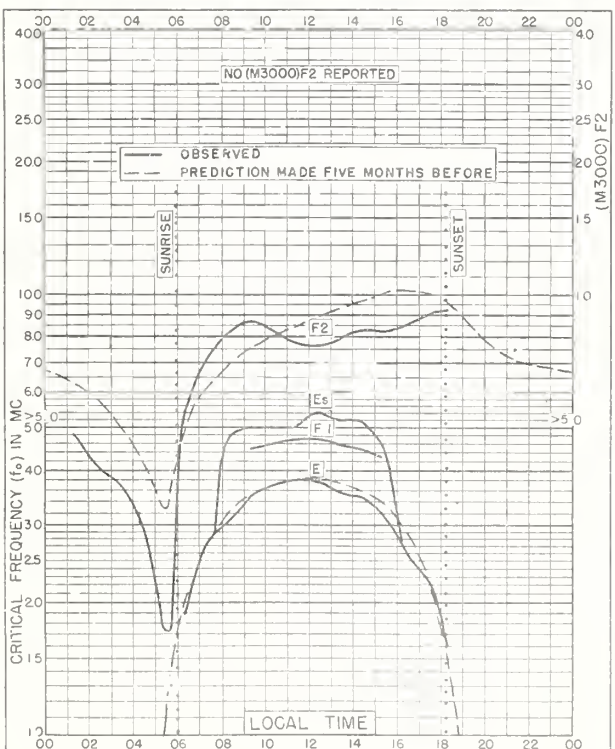

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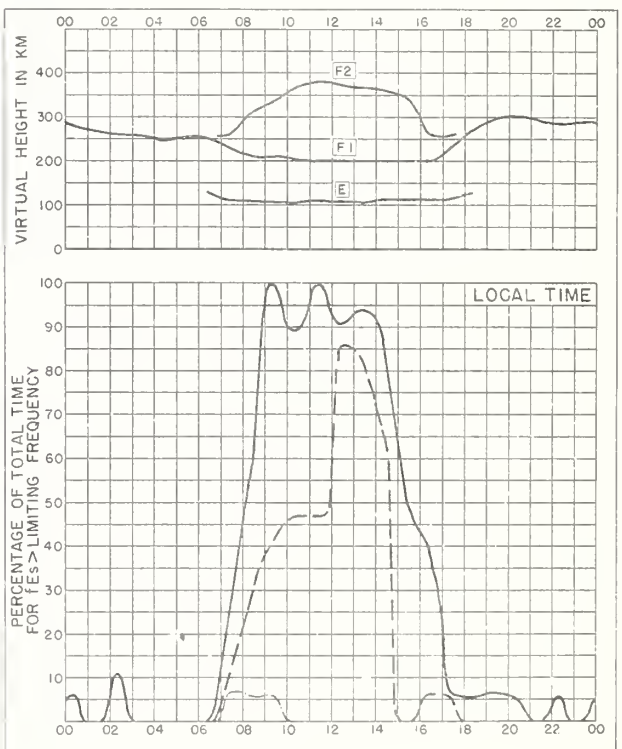

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CRPL and IRPL Reports

[A list of CRPL Section Reports is available from the Central Radio Propagation Laboratory upon request]

Daily:

Radio disturbance forecasts, every half hour from broadcast station WWV of the National Bureau of Standards. Telephoned and telegraphed reports of ionospheric, solar, geomagnetic, and radio propagation data.

Semiweekly:

CRPL—J. North Atlantic Radio Propagation Forecast (of days most likely to be disturbed during following month).

CRPL—Jp. North Pacific Radio Propagation Forecast (of days most likely to be disturbed during following month).

Semimonthly:

CRPL—Ja. Semimonthly Frequency Revision Factors For CRPL Basic Radio Propagation Prediction Reports.

Monthly:

CRPL—D. Basic Radio Propagation Predictions—Three months in advance. (Dept. of the Army, TB 11-499-, monthly supplements to TM 11-499; Dept. of the Navy, DNC 13 ( ) series; Dept. of the Air Force, TO 16-1B-2 series.)

CRPL—F. Ionospheric Data.

*IRPL—A. Recommended Frequency Bands for Ships and Aircraft in the Atlantic and Pacific.

*IRPL—H. Frequency Guide for Operating Personnel.

Circulars of the National Bureau of Standards:

NBS Circular 462. Ionospheric Radio Propagation.

NBS Circular 465. Instructions for the Use of Basic Radio Propagation Predictions.

Reports issued in past:

IRPL—C61. Report of the International Radio Propagation Conference, 17 April to 5 May 1944.

IRPL—G1 through G12. Correlation of D. F. Errors With Ionospheric Conditions. (G1, G3, available. Others out of print; see second footnote.)

IRPL—R. Nonscheduled reports:

R4. Methods Used by IRPL for the Prediction of Ionosphere Characteristics and Maximum Usable Frequencies.

R5. Criteria for Ionospheric Storminess.

**R6. Experimental Studies of Ionospheric Propagation as Applied to the Loran System.

R7. Second Report on Experimental Studies of Ionospheric Propagation as Applied to the Loran System.

R9. An Automatic Instantaneous Indicator of Skip Distance and MUF.

R10. A Proposal for the Use of Rockets for the Study of the Ionosphere.

**R11. A Nomographic Method for both Prediction and Observation Correlation of Ionosphere Characteristics.

**R12. Short Time Variations in Ionosphere Characteristics.

R14. A Graphical Method for Calculating Ground Reflection Coefficients.

**R15. Predicted Limits for F2-Layer Radio Transmission Throughout the Solar Cycle.

**R17. Japanese Ionospheric Data—1943.

R18. Comparison of Geomagnetic Records and North Atlantic Radio Propagation Quality Figures—October 1943 Through May 1945.

**R21. Notes on the Preparation of Skip-Distance and MUF Charts for Use by Direction-Finder Stations. (For distances out to 4000 km.)

**R23. Solar-Cycle Data for Correlation with Radio Propagation Phenomena.

**R24. Relations Between Band Width, Pulse Shape and Usefulness of Pulses in the Loran System.

**R25. The Prediction of Solar Activity as a Basis for the Prediction of Radio Propagation Phenomena.

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R27. Relationships Between Radio Propagation Disturbance and Central Meridian Passage of Sunspots Grouped by Distance From Center of Disc.

**R30. Disturbance Rating in Values of IRPL Quality-Figure Scale from A. T. & T. Co. Transmission Disturbance Reports to Replace T. D. Figures as Reported.

**R31. North Atlantic Radio Propagation Disturbances, October 1943 Through October 1945.

**R33. Ionospheric Data on File at IRPL.

**R34. The Interpretation of Recorded Values of *fEs*.

**R35. Comparison of Percentage of Total Time of Second-Multiple *Es* Reflections and That of *fEs* in Excess of 3 Mc.

IRPL—T. Reports on tropospheric propagation:

T1. Radar operation and weather. (Superseded by JANP 101.)

T2. Radar coverage and weather. (Superseded by JANP 102.)

CRPL—T3. Tropospheric Propagation and Radio-Meteorology. (Reissue of Columbia Wave Propagation Group WPG—5.)

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**Out of print; information concerning cost of photostat or microfilm copies is available from CRPL upon request.